MARCH 28, 1955 NEWS ISSUE

Electrical World

Price 35 Cents A McGRAW-HILL PUBLICATION

Meet Kenneth Davis, AEC's new chief of reactor development

• The United States is ready to build any type, any size reactor. Economy is the only restraining factor.

. . . Page 16

Street Trees and Utilities—Can they exist in peace?

• For the first time this month the nation's leading arborists, street lighting experts, and utility engineers sat down together to examine a common problem.

. . . Page 25

Storage Methods That Cut Coalpile Losses

• Careful coalpile location coupled with correct handling and sealing methods can prevent costly fires and loss of heating value.

. . . Page 30

New Test Shows Way to Longer Pole Life

• Extensometer test of standing pole gives more accurate index to remaining strength than prodding, sounding, and boring metho

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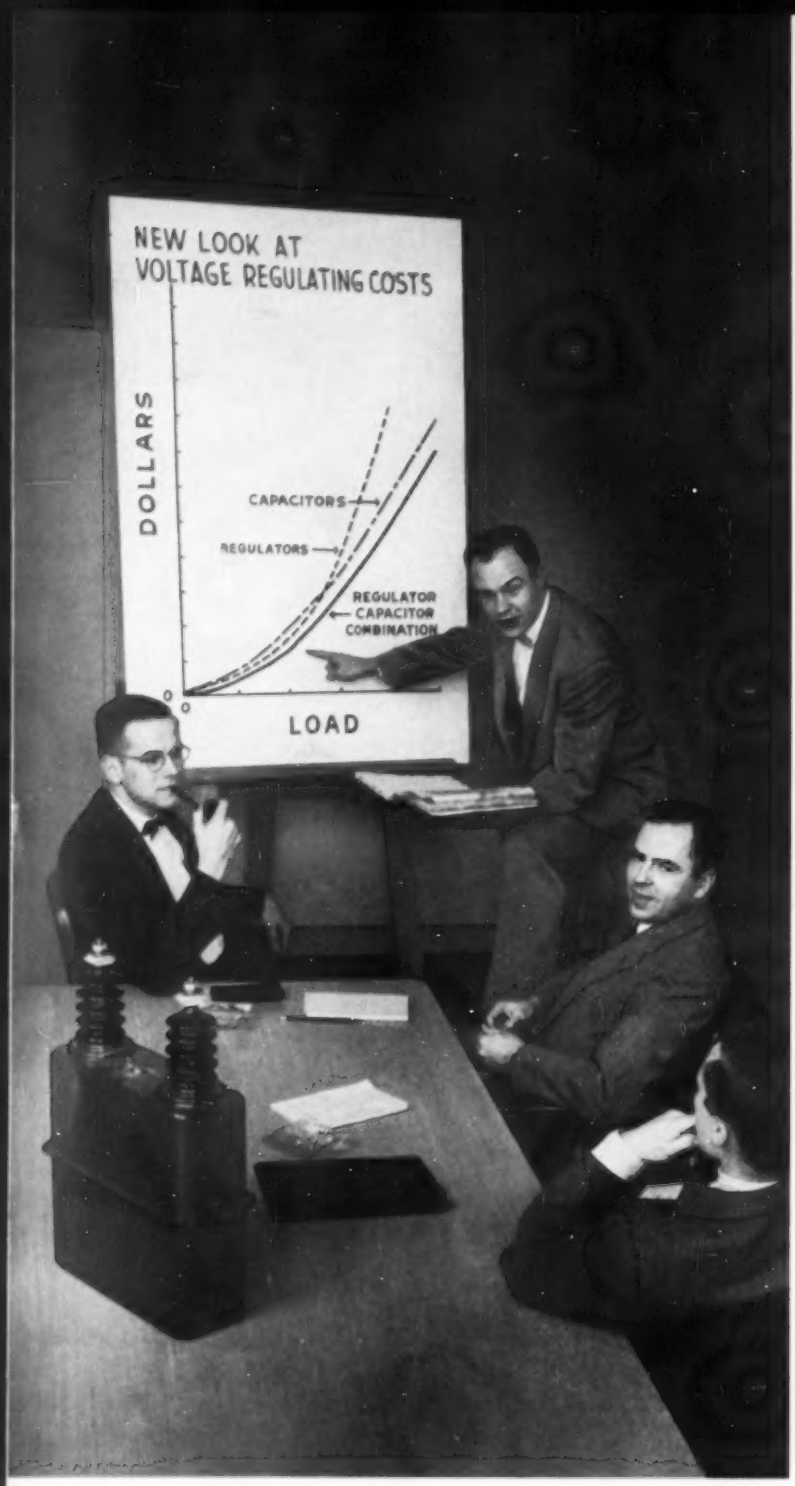

INCREASED DOLLAR SAVINGS on electric utility distribution systems are available if shunt capacitors and feeder voltage regulators are used in combination near the load, according to a recent General Electric study. In picture above, N. M. Neagle, G-E power capacitor application engineer, R. M. Butler, G-E electric utility engineer, and D. R. Samson, G-E voltage regulator application engineer, explain the savings possible as a result of increased system capacity through application of both.

Will it help trim distribution costs?

New study reveals best formula for boosting system load capability:—capacitors plus voltage regulators

System designers faced with selecting the most economical way to maintain proper voltage may find it profitable to take a new look at combining capacitors and feeder voltage regulators when it comes to improving customer service and stepping up system capability.

Since load trends are continuing in their upward surge, and since more revenue is obtained when voltage is correct, the task of these planners takes on added import. But the method chosen to regulate system voltage must pass the critical challenge: will it help trim distribution costs?

"OPERATION VOLTAGE" REPORTS FINDINGS

Recent General Electric studies on ways to establish good voltage conditions point to combining capacitors and voltage regulators for maximum return of dollars invested. The methods used in these studies to determine the proper ratio should offer distribution planners significant help in solving the problems presented by individual systems.

OPTIMUM RATIO DETERMINED

By calculating short circuit current, and open circuit voltage, it is possible to determine voltage, power, required regulator kva and capacitor kva at any point in the system. An extrapolation of these data to a typical system shows that when the unit cost of either type of equipment, plus that of power loss, is compared with the unit cost of both equipments plus power loss, the results strongly favor combining capacitors with feeder voltage regulators.

By applying General Electric's findings on the optimum application of capacitors and voltage regulators, electric utilities can hold down distribution costs and obtain maximum financial return from holding good voltage. For more details on applying the results of these studies to your system contact your Apparatus Sales representative, or write for GER-1029, Section 301-294, General Electric Company, Schenectady 5, N. Y.

MORE POWER TO AMERICA

GENERAL ELECTRIC

Electrical World

Vol 143 No 13 March 28, 1955

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COMING NEXT WEEK—With the continued growing use of electricity by residential customers, utilities find themselves faced with the problem of obsolescent meters. Replacing these is costly; so metermen are trying to find out just when economic or technical factors demand that a meter must be replaced. In three articles Electrical World will report the latest thinking on this subject.

Published for 81 years for those engaged in the business of generating, transmitting, distributing, or applying electric power

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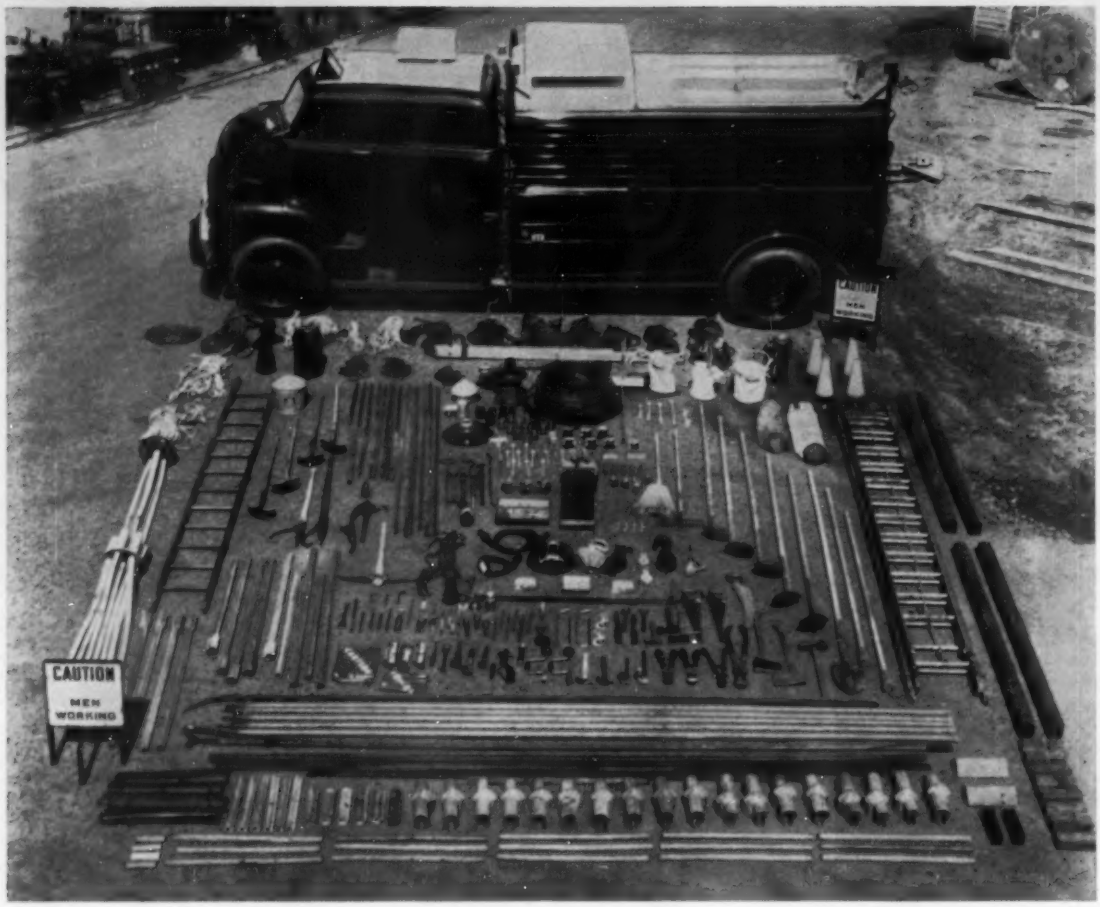

Look at your line truck equipment needs from this angle . . .

Here's a poles-eye view of a typical utility line truck showing the wide variety of construction and maintenance tools and safety equipment your linesmen need for most day-to-day jobs. But—without exception—each and every item shown can be ordered conveniently from your nearby Graybar office or warehouse . . . and in every case you get the type and quality needed to assure speed and efficiency on the job *plus* long years of satisfactory service. All are products your linesmen know and respect—products that have been tried, tested and proven in the field by scores of companies just like your own.

Remember, when you order "via Graybar", you save the time and expense of multiple inquiries, for you can select, from this single source, the items best suited to your needs from among the products of over 200 of the nation's leading manufacturers.

Graybar is thoroughly familiar with utility requirements. Further, your nearby Graybar Representative stands ready to help as a convenient source of information on everything needed for pole-line construction and maintenance. And should you be faced with an out-of-the-ordinary problem, call on the experience of a Graybar Outside Construction Specialist for a consultation. We'll welcome your inquiry!

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EDITORIALS

Spring and Annual Reports

March is a welcome month around Electrical World offices. It marks the arrival of spring with the promise of more pleasant weather. It is also the month when annual reports arrive in the greatest number. And each report is like a personal letter telling us what the company has done in the past year, its plans for this year, and often for the future. Each year the reports become more readable and more informative.

Scanning these reports makes us proud to serve and be a part of this ever-expanding industry devoted to public service. Here in an attractive format are the facts and information which we may have printed previously. They become more real as does a newspaper story retold by a friend who "was there."

From the reports we learn much and confirm much that we have already known. To the shareholders, who own the companies, spring and the annual reports are welcome signs of good weather and prosperous times ahead.

First an Inventory, Then a Museum

Scattered throughout the country are thousands of pieces of equipment, old plans, sketches, and other memorabilia pertaining to the history of the electrical industry. If gathered in one place these would make an impressive and interesting display and contribute another chapter in the industrial history of the country. Today a few pieces of such equipment are on display, but more are hidden away and forgotten.

It would be impossible for any single person to search out every item for such a collection even given the time and money. There is no one directory or inventory listing giving the location of such items.

That is the first step. An inventory should be assembled and printed. Perhaps a copy should be placed with the Smithsonian Institution in Washington. It might be desirable to place copies with a number of other museums, libraries, and educational institutions.

The second step is to establish, preferably in some central location, a national museum of electricity. There under one roof with replicas or originals, records, and plans, the story of electricity could be told accurately and interestingly. Such an effort could not but reflect favorably on an industry that has contributed so much to the progress of the nation.

Let's Gear Up to Sell AW Nationally

Again comes the plea: More direction for adequate wiring.

This time it's from A. F. Metz, Okonite Co, and president of the National Electrical Manufacturers Association. We need better coordination for local programs, he told the National Adequate Wiring Conference last month in Chicago (EW, March 14, p44). If local activities could be standardized to fit in with national publicity, the industry would take a big step forward in solving the problem.

"Take wire-on-time plans," he said. "They're spreading rapidly, but they still can't be advertised nationally. If we could tell the nation, 'you can modernize your wiring for as little as $5 a month,' we would go a long way toward eliminating adequate wiring in older homes."

From where would this coordination come? We said it before (EW, Jan. 31, p5), and we say it again: From an expanded National Adequate Wiring Bureau. Besides giving direction to local efforts, it could do the same for those who advertise nationally.

Electrical World right now is compiling results of a survey it has made among 87 utilities which together serve about three-quarters of the nation's electric customers. A full report will appear in a forthcoming issue, but a preliminary look bears out what most people have thought. Budgets are up, interest is high. These utilities alone, it appears, will spend an aggregate of millions for adequate wiring this year.

And don't forget the more millions being put into it by the manufacturers, contractors, distributors, and several other sources.

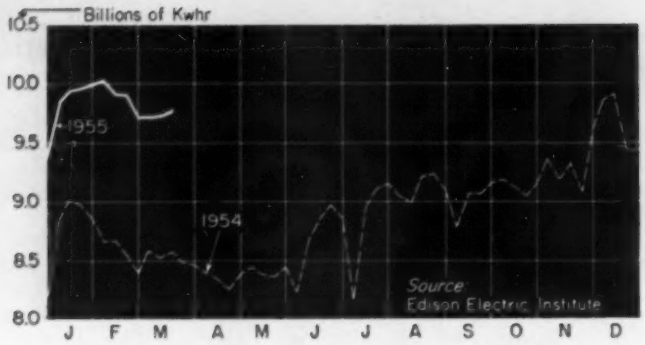
Add all this AW money together, and you come up with a figure that would rival, even top, the advertising budget of any "big-time" advertiser.

But with all this we still can't give the lady in Orofino the same sales pitch as the one we give the lady in Orlando. As Metz says, "Five dollars may put wiring into a home in Springfield, but what about a home in another town 50 miles away?"

They don't sell soap or automobiles that way. Electrical appliances aren't sold that way either. Manufacturers of these products use one theme, one approach. They cover the whole market. They motivate. They sell. They give direction.

Is adequate wiring any different?

THE ELECTRICAL WEEK



OUTPUT

Week Ended Mar. 19

9,814,000,000 Kwhr

Up 14.5%

Per Cent Change from Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Mar. 19	+14.5	+8.7	+7.2	+16.7	+5.1	+23.3	+12.7	+11.9	+14.2	+9.5
Mar. 12	+14.2	+9.6	+8.1	+13.2	+6.2	+25.9	+11.9	+12.5	+14.7	+6.1
Mar. 5	+13.3	+10.2	+6.9	+13.6	+6.9	+18.9	+11.8	+12.8	+16.8	+11.6

Seasonally Adjusted Index 186.1 Week Ago 183.5 Year Ago 162.2

The Issue's News Highlights . . . Eisenhower becomes entangled again in Dixon-Yates dispute when SEC's Demmler refuses to testify before House unit on financing plans, citing President's order prohibiting disclosures on private White House talks. Ike in news conference backs Memphis' plan to build plant, cancels out Dixon-Yates review . . . Partnership plan for Fryingpan-Arkansas project is proposed by two Colorado utilities . . . Abolition of REA state allotment formula is expected.

Atomic Power: AEC has approved study of reactor technology by Combustion Engineering, Inc, under the Industrial Participation Program . . . University of Michigan has awarded Babcock & Wilcox Co contract for construction of nuclear research reactor . . . Ten insurance executives studying nuclear reactor hazards (EW, March 21, p 101) under AEC clearance are expected to issue their report in about a month. Their study will be unclassified and made available to other insurance companies . . . Consolidated Edison of N. Y. has applied to AEC for the first license to operate a nuclear power plant. No others have come in before EW went to press. The plant will be located at Indian Point in Buchanan in Westchester County. It will cost approximately $55 million. AEC officials do not yet know how many licenses Con Ed will need (special nuclear material, construction, operators', etc). Company has entered into a contract with Babcock & Wilcox to design and construct the reactor portion of the station.

The "recipients of special privilege and benefits, you may be sure, will never give them up without a noisy and furious struggle," said EEI Pres Harold Quinton at Boca Raton, Fla., last week. His comment received prompt illustration. From Tennessee: A bill requiring MVGC to obtain a certificate from the PSC before it can build a transmission line into Tennessee. This, in case a federal appropriation to build Tennessee portion of line is knocked out (See p 8).

Expansion: Commonwealth Edison has placed in operation first 160,000-kw unit of new Will County Station. Second unit of same size will be completed this summer, and third unit of 250,000 kw is scheduled for completion in '57 . . . With eight units now in operation, TVA's Shawnee steam plant has 1,080,000-kw capacity. When completed, its 10 units will give it capacity of 1,350,000 kw . . . San Diego G&E has scheduled $19.2 million for construction this year—second highest total in firm's history.

Ohio has appointed Edward J. Kenealy, a Democrat, to PUC to replace Ray O. Martin. Kenealy shares Gov Frank J. Lausche's views on amending state's present rate-fixing formula. Lausche had refused to reappoint Martin, also a Democrat.

NEWS OF THE INDUSTRY BRIEFLY TOLD

Off the Washington Wire . . . Joint Atomic Energy Committee is revising its mailing list. To be included or have listing revised, notify Corbin Allardice, executive director, AEC, U. S. Senate Post Office, Washington 25, by April 15 . . . House approved $400,000 for Southwestern Power Administration to continue interim contracts with co-ops until June.

Southeastern Electric Exchange has elected following officers: W. J. Clapp, president (Florida Power Corp pres); George S. Dinwiddie, first vp (New Orleans PS pres); L. M. Smith, second vp (Alabama Power Co pres), and G. L. Furr, third vp (Appalachian Electric Power vice pres and general manager).

Annual report of New York State Power Authority, signed by five trustees, but sounding like the chairman, Robert Moses, promises to take its fight to develop Niagara River power to Supreme Court . . . NRECA has urged Congress to abolish Hoover Commission on Governmental Reorganization, charging it has joined the "vested interests."

National Industrial Conference Board reports it is receiving more applicants than it can handle for scheduled atomic energy course for management, April 25-30, and again June 20-25 . . . Reports on current electronics tools in accounting will highlight EEI-AGA utility accountants conference, Chicago, April 25-27. For reservations write A. E. Softy, secretary, EEI accounting division, 420 Lexington Ave, NYC.

Cleveland Electric Illuminating, Ohio Edison, and other Ohio utilities were hit by worst wind storm of year last week. CEI had 600 repair men on job within few minutes after 70-80 mph winds hit city. From 14 to 25 feeder lines were broken, and estimated 10,000 customers were hit by outages in first 20 minutes of storm. Ohio Edison reported widespread damage.

Arkansas State Electric Co-ops, Inc, representing 18 co-ops, has voted to join three co-ops to build 100,000-kw plant at Ozark, Ark. This triples size of originally planned plant . . . Maine PUC Chairman Sumner T. Pike advocates repeal of state's 45-year-old Fernald Law banning export of hydro power . . . Daniel W. Tracy, president emeritus of IBEW-AFL, and assistant Secretary of Labor, 1940-46 died in Washington, D.C., last week.

ABOUT PEOPLE IN THE INDUSTRY

Harold Quinton, president, Southern California Edison and EEI, in addressing SEE, warned the utility industry to guard against: The notion "that it is unprogressive," the "notion that thrift is no longer necessary," the "nation that it is making an unreasonably large return on its capital investment." He noted that utilities' customers "have been penalized over the years by enactment of unfair and unduly burdensome" laws and regulations. "We cannot leave it to someone else to bring about needed corrections."

Because U. S. can proceed more deliberately than England in development of atomic power, it should "select a succession of demonstration reactors which will not be duplicates or minor variations of one another," Pres Philip Sporn, American G&E, told Southeastern Electric Exchange. By choosing "very different type reactors," each one will add substantially to atomic power knowledge. He also cautioned the industry not to "neglect our more conventional power technology" in efforts to develop atomic power.

More News About People page 36

Dixon-Yates Dispute Flares Up Again

Demmler: Balks at House Query

Despite his unwillingness to discuss the Dixon-Yates contract publicly, President Eisenhower twice has found himself embroiled personally in the controversy.

Once he spoke out on it during his weekly press conference (see below).

Again he was involved when Securities and Exchange Commission Chairman Ralph Demmler was questioned by Congressmen. In that discussion, Demmler was asked whether he had talked over the contract with Eisenhower before SEC approved Dixon-Yates' financing plans. Demmler, testifying before a House Appropriations subcommittee, refused to say on the basis of the President's order of last year prohibiting disclosure to Congress of private White House talks.

The President's press conference remarks were prompted by the report that the Tennessee Valley Authority is trying once again to obtain administration approval of a new steam plant at Fulton, Tenn. Eisenhower has twice said no to this proposal, endorsing instead the private-power approach of Dixon-Yates. The three-man TVA board has been split on this question. The two Truman Administration holdovers, Harry Curtis and Raymond Paty, have kept up their anti-Dixon-Yates fight and pressed for the Fulton plant. The Eisenhower appointee, Herbert Vogel, continues to endorse Dixon-Yates and vote against Fulton.

Meanwhile, the City of Memphis and the State of Tennessee kept pitching. Tennessee is asking the U. S. Court of Appeals to overthrow SEC's approval of Dixon-Yates stock plans, and Memphis is going ahead with plans for the construction of its own power plant.

The new Dixon-Yates firm, Mississippi Valley Generating Co, joined with its sponsoring companies — Middle South Utilities, Inc. and

Ike's Press Conference

President Eisenhower made these statements at news conference:

- **Memphis Power Plant—I know of no reason why the city should not construct its own power station.**
- **Dixon-Yates Review—I don't know whether there is any reason for review or not.**

Mr President was asked the following by Marshall McNeil of Scripps-Howard Newspapers:—

Q.—The Dixon-Yates contract is apparently tied up in the courts, and a majority of the TVA board has lately asked you again for appropriations for the Fulton steam plant. I wonder whether that would prompt you, sir, to reconsider the problem of power in west Tennessee; and the second question, would the construction of a plant, generating plant, by Memphis itself not fit into your philosophy, sir?

A.—"Well, I know of no reason, to take your second question first, I know of no reason whatsoever that Memphis has not a complete right to manufacture or set up any producing plant it wants to. And certainly, I would favor it.

"I have nothing at all against local ownership of power. I think in many cases it is not only a good thing; in some cases it has been proved to be very effective.

"But there is one thing I always want to point out to you people when I talk about governmental authority, responsibility and operation. Don't forget this: When the federal government does this, they can print money to do the job. Nobody else can, and there is a very great difference; because the second that the federal government starts to print money to do these things, they are taking one cent or at least their proportion out of every dollar that any of you might happen to have in your pockets.

"Now that has the effect of cheapening money, and I don't think we ought to go into that.

"Now, as to the review of the case, it has not come up to me in any way in that form, and I don't know whether there is any reason for review or not. But I do say what the local governments or anything else that falls within the state or city authorities, I have no objection to it, to their doing it whatsoever."

the Southern Co — in asking to be a part of the Court of Appeals proceedings so they'll have a chance to fight it out legally. In filing, the three firms said their interests in the case are different from those of SEC, and said they may be bound by decision.

Acts to Block Dixon-Yates . . . In another development, the Tennessee House of Representatives passed legislation designed to block the Dixon-Yates power contract.

The measure passed the house following a strong plea in its behalf by Rep Eugene Collins of Chattanooga. The bill would make it mandatory for any private power company to receive state permission before it could deliver power into Tennessee.

MVGC Pile Driver

The pile driver shown above is putting down the first test piling on the 604-acre site of Dixon-Yates' Mississippi Valley Generating Co's West Memphis, Ark., steam plant. Crews are sinking the tests to depths up to 70 ft to find the best footing for foundations for the $107-million station. MVGC's Pres Edgar Dixon said the project will take three years to build and will employ about 3,000. Company has a contract with the Atomic Energy Commission to deliver 600,000 kw to serve defense needs.

Push Fryingpan 'Partnership'

Public Service of Colorado and Southern Colorado Power back joint $160-million project like Upper Colorado

Two private utilities already pressing for a partnership approach to the $1-billion Upper Colorado Basin Project are proposing a similar plan for the $160-million Fryingpan-Arkansas Project. The project would divert water from the Fryingpan and Roaring Fork Rivers, tributaries of the Colorado River on the western slope of the mountains, through the great divide in southeastern Colorado to the Arkansas River on the east slope of the mountains. Purpose is to deliver more water to the Upper Arkansas River in Colorado.

Public Service Co of Colorado and Southern Colorado Power Co are old-timers in the area. Public Service and its predecessors have operated there for 46 years; Southern Colorado has been in business 43 years. They've grown with the area. Public Service will have 238% more capacity in 1957 than it had at the end of World War II—and they don't want to get pushed aside by the only two major federal water projects backed by the Republican Administration.

Here's the plan they're selling:

They'd make their systems available, and build any new transmission facilities needed to take the power they buy, or to wheel to preference customers. They'd only buy power not contracted for by the preference buyers, and their wheeling rates would be set by the Colorado Public Utilities Commission. The one thing they'd insist on is that the government be prohibited by law from building lines to compete with those they already have laid.

Public Service already has a 115-kv line paralleling the Arkansas River between Leadville and Salida, Colo. Of the hydro generating stations envisioned by the Eisenhower Administration six are immediately adjacent to this line, which is part of the company's backbone system. The other generating station is near Pueblo, in the heart of the Southern Colorado service area. Altogether these seven plants would have installed capacity of 104,800 kw. They'd put out about 500 million kwhr a year.

(*Continued on page* 10)

Interior Dept. Comparison Costs

	1953	1954
Irrigation	$ 75,128,000	$ 67,653,000
Municipal & Industrial Water—		
Delivery Features	21,500,000	16,328,000
Other	11,154,000	8,200,000
Power	41,945,000	44,551,000
Flood Control	20,341,000	17,911,000
Wildlife	2,830,000	1,898,000
Total	$172,898,000	$156,541,000

Interior Dept. Comparison of Benefits

	1953	1954
Power Revenues—		
Firm Power Rates—Mills	5.5	6.0
Net Annual Revenues—$	1,504,400	1,720,200
Conservancy District Revenues—		
Irrigation (initial year)—$	622,000	657,000(a)
Municipal & Industrial Water—$	1,064,000	855,000(a)
Benefit-Cost Ratios—		
Direct Benefits Only	1.05 to 1	1.05 to 1
All Benefits	148 to 1	1.47 to 1

Notes—(a) Includes tax.

The companies would benefit from an integration plan, of course. It's a natural for them because of the proximity of the planned project. But they figure the government and the area would make a profit, too. They say their plan would:

- Cut the cost of the project by using existing facilities and by having the companies pay bill for new lines.
- Provide more net revenue for the federal share.
- Provide a plan for equitable sale and disposition of project power through the general project area.

They estimate, in fact, that more than $4.7 million in transmission lines (355 miles) and substations (50,000 kva) could be eliminated from the federal budget if included.

Reclamation Bureau hasn't taken a stand on companies' proposal.

But bureau has revised its 1953 estimate of costs. That plan (published in House Document 187, 83rd Congress, 1st Session) gave project cost as $172,898,000. The bureau and Interior Secretary Douglas McKay now thinks its project would cost only $156,541,000. And they believe bigger revenues would cut the repayment period from its original estimate of 69 years to 59 years. (See p 9.)

Higher revenues would come from charging 6 mills a kwhr, rather than the 5.5 mills originally contemplated.

Nominee for AEC

Allen Whitfield, a Des Moines attorney, has been nominated as a member of the Atomic Energy Commission by President Eisenhower. If confirmed by the Senate, Whitfield will serve until June 30, filling out the term of Joseph Campbell who resigned to become Controller General.

REA Formula Repeal Expected

Abolition of state allotment funds plan is slated for this session of Congress despite Rep Whitten's opposition

Opposition to abolishing the state allotment formula covering Rural Electrification Administration loans has boiled down to one individual in Congress—Jamie L. Whitten (D-Miss.). But Whitten is in no position to do much about it. The formula will be abolished during the current session. REA is in favor of this, and it's backed by major rural co-op associations.

Here's a rundown on the current situation with regard to abolition of the formula which earmarks half of REA's funds for distribution in states with the lowest ratio of unelectrified farms:

The Senate Agriculture Committee has approved its repeal. However, it withheld its report for a few days because of National Rural Electric Cooperative Association objections to putting an end to the Agriculture Department's annual unelectrified farm survey. As approved by the Senate group, the survey would go out the window with repeal of the formula.

NRECA Testifies . . . NRECA appeared at a hearing last week before a subcommittee headed by Sen Hubert Humphrey (D-Minn.). At that time, REA said the survey is no longer needed, but its argument was lukewarm. Feeling is that the survey will be retained.

Whitten, chairman of the House Appropriations subcommittee on agriculture, opposed repeal of the formula in recent hearings at which REA Administrator Ancher Nelsen testified for his 1956 budget request. Whitten's argument—strong one in view of the history of REA appropriations—is that Congress will meet all REA's legitimate needs for loan money for rural co-ops, regardless of whether there's a formula or not. Nelsen agreed, but held out for abolition.

One reason Whitten doesn't want the formula repealed is that his district is in a state which has less than 75% of its farms electrified. But Whitten's subcommittee can't write the legislation. Formula repeal is up to House Agriculture Committee.

At Whitten's hearing on the 1956 budget, Nelsen stated if the formula isn't repealed, the agency would have to ask for more money than they really need in order to meet the generation and transmission requirements of states that are almost completely electrified. He pointed out that G&T needs in Colorado alone may run as high as $27.1 million. The amount available for this state under the formula is about $14.2 million. Under the formula's restrictions, REA would have to have made available to it another $240 million in lending authority to cover the additional $12.9 million needed in Colorado. Without the formula, the agency would need far less in new funds.

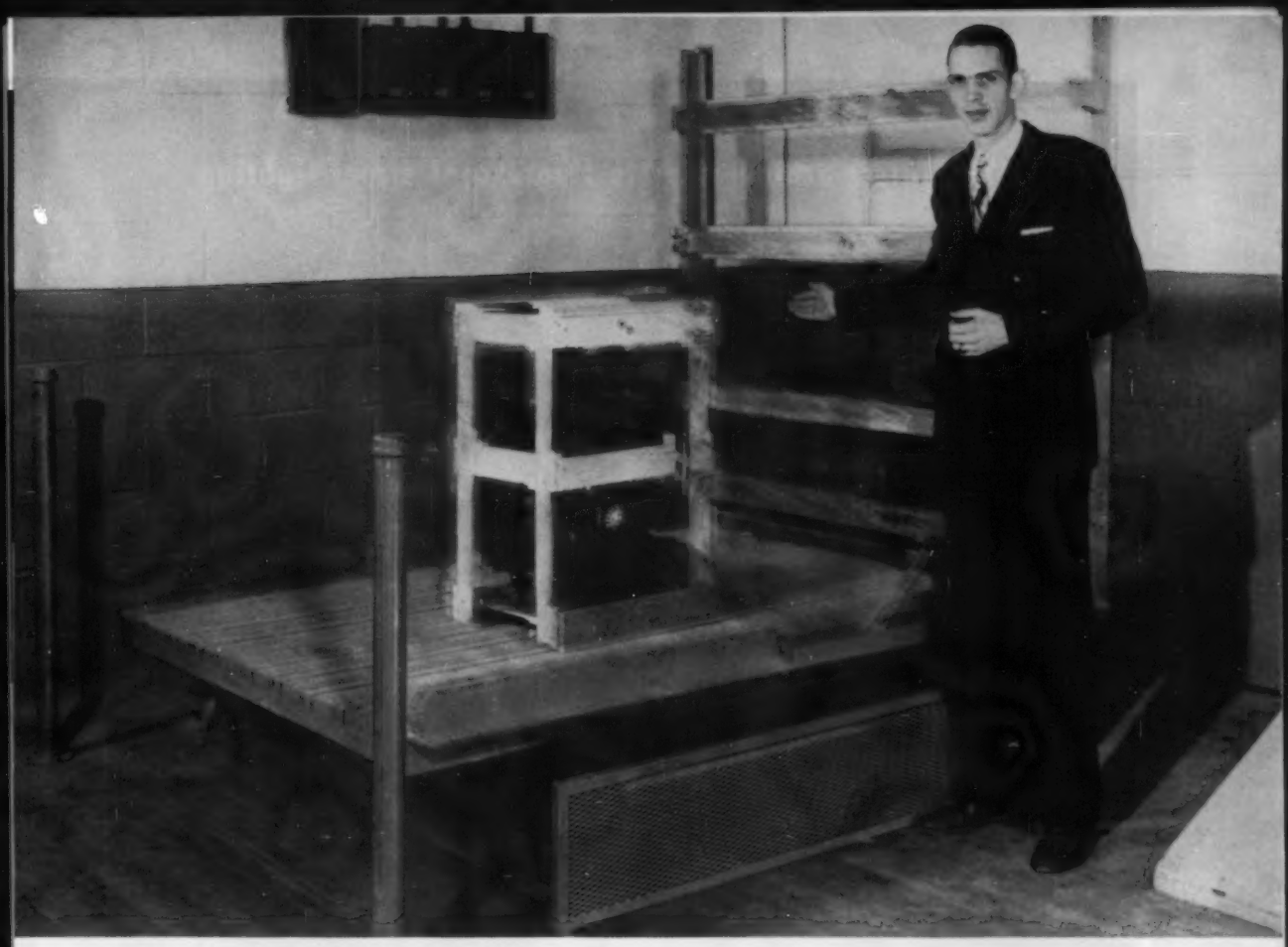
Biggest selling point Nelsen used is that funds already available to REA this year totaled $221 million—more than enough to meet all 1955 loan needs without the state limitations embodied in the formula.

Appliance Advertising Analyzed at Nema Meet

Members of the National Electrical Manufacturers Association's Major Appliance Division, at their recent winter meeting in Chicago's Edgewater Beach Hotel, hit an optimistic note for the future home-appliance market and reviewed advertising and promotion campaigns of the various sections of the division.

Optimism for the market stemmed largely from the following statements and statistics: The public has been convinced, through past advertising, that appliances are a modern necessity; an estimated 1.3 million homes will be built in 1955; 30 million people move each year creating a replacement market; and electrical power output topped 10 billion kwhr for the first time in January indicating increased use of appliances.

The following groups held meetings to discuss their respective advertising and promotional campaigns for 1955: Electric Range Section, Electric Water Heater Section, Farm and Home Freezer Section, Household Sink Units Section, and Electric Fan Section.



F. H. Sherriff, Distribution Transformer Product Engineer, witnesses the

FACT: New Westinghouse transformers are tested to meet National Safe Transit Committee standards

THE SAFE TRANSIT LABEL

The Safe Transit Label certifies the shipping stamina of the new Westinghouse pole-type distribution transformers. They must pass the rugged vibration and shock tests of the National Safe Transit Committee—tests verified by shipping experience and approved by carriers and manufacturers alike. This label—the first on *any* transformer—indicates that everything in shipping science has been done by Westinghouse to assure safe delivery to you.

It's more proof of more quality—more for your transformer dollar—with Westinghouse.

• • •

Get still more proof from The Man With The Facts—your Westinghouse Sales Engineer. Or write to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-70739

YOU CAN BE **SURE**...IF IT'S

Westinghouse

The latest achievement in fluorescent street lighting

FACTS about the new Westinghouse fluorescent street lighting luminaire

FACT: Top efficiency—The new 4-FSL-72 fluorescent luminaire has a large one-piece reflector and offset lamp arrangement. No physical obstructions interfere with light distribution.

FACT: Day and night eye appeal—The smooth fiber glass hood and clear plastic cover blend to produce a clean silhouette by day and a comfortable light source at night.

FACT: Easily maintained—Cover opens from either side by releasing 3 spring tension latches permitting speedy relamping and cleaning. Sponge neoprene gasket seals out bugs and moisture. Cover can be easily replaced in frame by removing 4 screws—slide out old cover—slide in new—without further adjustment.

FACT: Extremely durable—rugged fiber glass hood does not require paint. Extruded methylmethacrylate cover will not craze or discolor. Wiring is by duplex circuit so when a lamp fails, only one lamp in a reflector goes out.

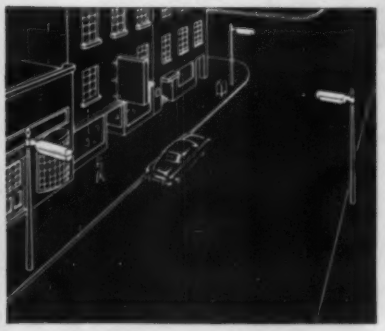
4-FSL-72 can be mounted horizontally or at any angle between 20° and 30° for different light distribution patterns.

For more FACTS see *The Man With The Facts*—your Westinghouse representative.

J-04364

YOU CAN BE **SURE**...IF IT'S

Westinghouse



This exciting new look in street lighting is an attractive addition to any community.

For all the benefits of fluorescent lighting—ask about the new 2-FU-72 for tunnels and underpasses.

Announcing

O-B'S NEW ASA STANDARD BUSHING

Built on 40 years of
successful bushing experience

WRITE FOR BULLETIN 1336-H

Ohio Brass

MANSFIELD, OHIO, U.S.A.

4522-H

Edison Plant Work Is Started by Switch-throw

Construction of Southern California Edison Co's $24 million Alamitos steam station, seen in artist's sketch above, has started at the plant site east of Long Beach.

At ceremonies marking official start of construction, Mrs Catharine Bixby Hotchkis (at right) threw a switch to start a pile driver working on the station's foundation. Mrs Hotchkis is a descendant of the original owners of the plant site, once known as Rancho Los Alamitos. With her (left to right) are Harold Quinton, Edison's president, and Burton W. Chace, Los Angeles county supervisor.

The first of the new plant's four 160,000-kw generators is expected to be in operation by late 1956.

Alcoa Gets FPC Go-Ahead for $10-Million Project

Two Aluminum Co of America subsidiaries—Tapoco, Inc, Alcoa, Tenn., and Carolina Aluminum Co, Badin, N. C.—have been given a green light by the federal government to go ahead with plans for a $10-million dam and power plant project on the Little Tennessee River near Chilhowee, Tenn.

Federal Power Commission's 50-year license to build the Chilhowee project covers construction of a 50,000-kw power plant and a dam, 82 ft high, 1,410 ft long, forming a 1,690-acre reservoir. It also includes permission to operate, as a part of the same power system, three existing dams in Tennessee and North Carolina with installed capacities of 121,500, 110,000, and 45,000 kw.

The new project will be constructed by Tapoco, but, like the other three dams involved, will be operated by the Tennessee Valley Authority.

Approval of the new development also has been provided by the State (Tenn.) Public Service Commission, which held hearings on the request last week. The petition for a PSC construction permit stated that the new dam is intended to provide a more stable power supply for the Alcoa plants where production has been curtailed by a power shortage resulting from recent droughts.

Tapoco plans to start construction as soon as PSC permission has been obtained. The entire system, composed of the new project and the three existing dams and power plants, is expected to produce power at the annual rate of 177 million kwhr beginning in spring of 1957.

Northwest Dams Slated

Pacific Northwest Power Co's application for a permit to build dams at Mountain Sheep and Pleasant Valley, on Idaho's Snake River, has been approved by State Reclamation Engineer Mark R. Kulp. The state's irrigation rights, Kulp said, are protected under the permit which allows appropriation of 25,000 cu ft of water per second at each site and 300,000 acre ft of storage at Pleasant Valley. Approval of the Federal Power Commission has not yet been received.

Suppliers to Key Projects Qualify for Fast Write-Offs

The government has set up an expansion goal for transmission and interconnection lines needed to pump power to military and atomic energy installations and defense plants of the country.

This means that, for the first time, utilities, rural electric co-operatives and others who supply power to such customers may qualify for rapid tax write-offs on their transmission line investments.

There's no limit on the goal, which means the government will grant write-offs for any capacity line of any size, just so long as the defense tie-in qualifies.

The Interior Department requested establishment of the goal because it had received requests from Atomic Energy Commission power suppliers, among others, for rapid tax amortization of their lines.

These power suppliers were not able to qualify for the rapid tax amortization benefits until the expansion goal had been set up by the federal government.

THE PRESENT: "Big problems right now are not technical. We can build any size and type of nuclear power plant the utilities desire."

THE PROGRESS: "The pressurized water reactor is farthest along. The sodium reactor and liquid metal reactor seem more promising."

Producers, Not Utilities, Should Lead

W. Kenneth Davis, the 37-year-old chemical engineer who has just taken over the job of running the Atomic Energy Commission's reactor development program (EW, March 7, p73), has some definite ideas on what must be done to put the atom to work in industry.

"We have probably put the emphasis in the wrong place in solving the problem of having a nuclear power industry. Electrical equipment manufacturers—not the utilities—should be the ones who take the lead," Davis told Electrical World in an interview.

"It's not that the manufacturers are necessarily dragging their feet. I can understand how they feel about jumping into something like this," Davis said. "But they're the ones who traditionally go ahead and do the developing—get products on the market—when the utilities indicate they are ready as a market for something new."

Davis does not discount impact of utilities' leadership in the reactor field. In fact, in chastising equipment makers for going too slowly, he emphasizes the important part utilities play in speeding up development.

Praises Consolidated Edison . . . Davis is an engineer with plenty of background on which to base his opinions. And before taking over his present job, he served seven months under his predecessor, Dr Lawrence R. Hafsted.

The reactor chief characterizes as "wonderful" the approach of Consolidated Edison Co of New York, for its plans to put up a nuclear power plant near Peekskill, N. Y., without aid from the government.

The biggest benefit he sees from Con Ed's action is the impetus it is giving manufacturers to develop the best equipment. That's why Davis likes pressure from the utilities, a pressure which traditionally has forced equipment makers to go all out in competition with each other to supply utilities with what they demand in performance.

Davis feels that the big problems right now are not technical. He believes we can build any size and type of nuclear power plant. The big problems are economic—costs are high even for those reactors on which most developmental work has been done and which can be put to work right now making electricity. For more advanced designs with the most long-run promise in the power field, costs at this stage are prohibitive.

AEC will continue to pay part of the cost of getting the best type into production if industry can't do the job itself. But the agency definitely is opposed to an all-out federal program or anything approaching it.

Davis Answers EW's Questions . . . Here are some observations by the new reactor chief in answer to Electrical World's questions:

Q. Is there any consideration being given to the use of a gas turbine in conjunction with a nuclear plant?

A. Yes, there have been a few studies made, but not as much work has been done as on other types of cycles. This cycle would have the advantage of the direct use of the high temperatures generated in the reactor. But it has the mechanical problem of pumping large volumes of gas—the disadvantage of not being applicable to large size power units. However, this may be an advantage in building units for international use.

Q. What about gas cooled reactors as used in Britain—any future in them?

A. I don't think so. Britain got into them so it wouldn't have to face corrosion problems. It is probably doing this out of necessity, not choice.

THE POTENTIAL: "The Brookhaven liquid metal reactor does look attractive. We hope some industrial team will develop it."

THE LAG: "Less demonstrable progress has been made in the field of fuel element processing than in any other field."

In Nuclear Development, Says Davis

Q. Of the reactors of the AEC five-year plan, do any look more promising as power reactors than others?

A. The pressurized water reactor is farthest along. But water reactors operate at low temperatures. The PWR is designed for only about 600F. The sodium reactor and liquid metal reactors in general seem more promising because of the possibility of higher coolant temperatures. Temperatures of 1,000F, perhaps 1,400F, are a possibility.

Q. Do any other types seem attractive?

A. The Brookhaven liquid metal reactor does look attractive. Babcock & Wilcox Co is now making an evaluation on its use, and if it is attractive, we hope some industrial team will pick it up and develop it.

Q. How about a separately fired superheater to secure better steam conditions to be used in conjunction with the nuclear cycle?

A. Some people have looked into this possibility, and it can be used. But I don't think the investment is justified in light of other alternatives.

Q. Have any other utilities or teams beside Duquesne Light Co made proposals to build nuclear plants?

A. There has been no formal application for license. It is hoped that some companies will come forth before the April 1 deadline. We have had informal discussions with Con Ed and Detroit Edison Co. You must keep this in mind: Not all utilities can afford to go it alone like Con Ed. So, the AEC proposal to help finance part of the most attractive nuclear power plant projects is the next best thing. But AEC isn't prepared to underwrite all risks.

Q. What about plant sizes?

A. All studies are talking in terms of large units, 150Mw and larger. I believe there is need for consideration of an intermediate class (75 Mw or smaller) for utilities both in this country and abroad.

Q. What are the main technical problems designers must face in developing reactors for the utility industry?

A. Less demonstrable progress has been made in the field of fuel element processing than in any other. We have no practical experience in this field—fuel element processing for other types of reactors, research reactors, etc. is an entirely different art. In fact, the chemical processing phase of the development seems to be lagging most.

Q. What should equipment makers and utilities do that they are not now doing?

A. Manufacturers should set up their own laboratories and related facilities. Babcock & Wilcox's new fuel fabricating plant is a good sign. But they all have to do this. They depend too much on AEC.

Q. What's being done on reactor hazards?

A. Insurance companies are conferring with AEC to examine the liabilities involved. The insurance industry will, I believe, be able to handle the problem without assistance from the government.

Q. How about thorium as a fuel?

A. It looks very promising. It's a little more expensive to get started with a thorium reactor, but it does have the possibility of being bred in a thermal reactor. Thorium is probably three times as plentiful as uranium, but at the present time there are no known concentrated deposits of this material.

SG&E Holds Management Conference

About 150 managers and executives of the Southwestern Gas & Electric Co gathered recently in Shreveport, La., for the company's annual management conference. Chairman Frank M. Wilkes (above left) is shown examining one of the charts used in his speech to the group. With him is President J. Robert Welsh.

Welsh told the gathering that despite increased costs for taxes, office rent, fuel, labor, and materials, the company has been able to sell electric service without a rate increase. This has been possible because of improved equipment, increased engineering efficiency, greater consumer consumption and improved productivity of employees, he said.

Other speakers included Wilkes, Clarence Manion, former dean of Notre Dame's Law School, and John S. Osborne, president, Central & South West Corp.

California Water Supply Reported Below Average

In its second water conditions report for 1955, the California Division of Water Resources says a below average supply is indicated unless precipitation considerably in excess of normal occurs during the remainder of the season.

The first report was based on conditions existing Feb. 1. The new report, showing conditions on March 1, disclosed little precipitation during the month.

Runoff during the five months prior to March 1 has been below average on all major California streams, the report noted. Major conservation reservoirs serving areas in California had in storage on March 1 about 45% of their total capacity, which is approximately 5,144,000 acre ft less than one year ago.

The major portion of this decrease was at Lake Mead on the Colorado River where the storage on March 1 was at the lowest stage since 1941.

Electrical power generation at Hoover Dam is being curtailed as a result of the low storage level.

Storage in intrastate reservoirs, it is noted, is about 76% of the ten-year mean and 446,000 acre ft less than one year ago.

All conservation reservoirs in the important region serving the central valleys with irrigation water and producing hydroelectric energy are expected to fill during the snowmelt runoff period with the possible exception of the Bureau of Reclamation's Shasta reservoir and the Pacific Gas & Electric Co's Lake Almanor.

In the Lahontan area serving southern California, with the snowpack as of March 1, water impounded in surface reservoirs and general soil moisture conditions indicate that precipitation in excess of normal would be required during the remainder of this current water year in order to produce average water supply conditions.

The Los Angeles Department of Water and Power forecasts that with average weather conditions the April-September runoff for Mono Basin and Owens Valley will approximate 78% of the long-time mean.

POWER BRIEFS

● First work on the $146-million Cowlitz River power project of Tacoma (Wash.) City Light has begun with grading of a 3,200-ft access road to the Mayfield site. Completion of the road is expected next month. Specifications are near completion for the Mayfield Dam, first of two on the river. The Mayfield Dam will be 850 ft long and 18 ft high.

● Tennessee Valley Authority announces that two additional steam plant generating units of 180,000 kw each have gone into commercial operation, bringing the system capacity to 7,484,185 kw. The two new units are the second at the Colbert plant in northern Alabama and the sixth at the Kingston plant near Kingston, Tenn.

● California Public Utilities Commission has approved Pacific Gas & Electric Co's application for construction of 106,000-kw Poe hydroelectric plant, scheduled for operation on the North Fork of the Feather River in June, 1958. The $40.6 million project has been licensed by the Federal Power Commission.

● Florida Power Corp now has under construction an addition to its Enterprise plant near Sanford which will almost double its present 41,000-kw capacity. It is part of a $242-million expansion program begun in 1947 and to be completed by 1958.

● Columbia University has started work on a nuclear physics research building to house a new 6-million-electron-volt accelerator. The building will be known as the George B. Pegram Laboratory. Atomic Energy Commission is providing $295,000 toward the $350,000 the structure will cost.

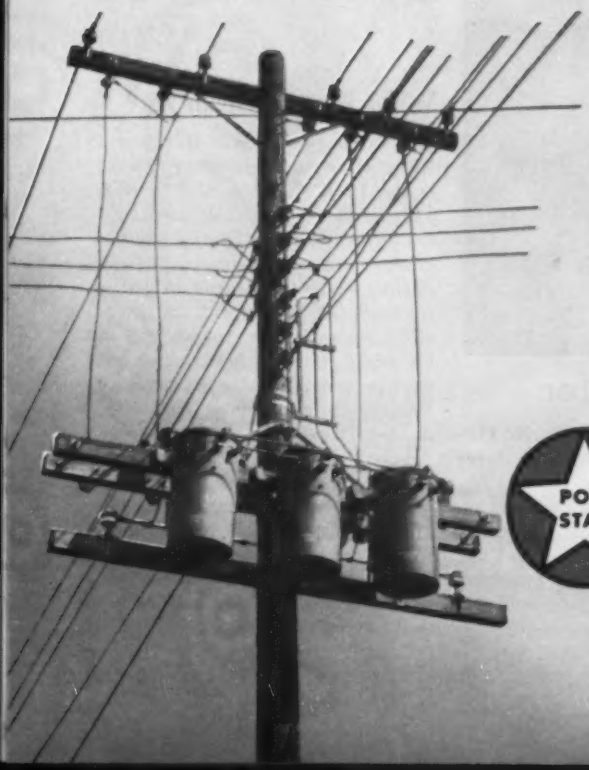
● Bureau of Reclamation has awarded Malcolm W. Larson Contracting Co of Denver a $1,493,268 contract for 207 miles of 115-kv, wood-pole transmission line in Wyoming and Nebraska as part of the Missouri River Basin Project.

you don't have to tip that crate ...it's a "Pole Star"

As a matter of fact, the truck operator doesn't even *need* a helper to handle Pennsylvania Pole Star transformers from 3 through 100 Kva, 15 Kv and below. That's because they're all furnished with wrap-around, wire-bound crates equipped with *bottom skids* . . . a practice long followed by Pennsylvania Transformer Company for units 37½ through 100 Kva and now extended to all smaller Kva sizes.

This newest Pole Star "extra" means easier handling at every stage: when unloading incoming trucks . . . when arranging stocks in the warehouse or pole yard . . . when loading for transportation to the field. The crates are designed for handling by one man with a standard warehouse-type fork lift truck. Transformers may be stacked vertically, too, for conservation of space.

Customer advantages like the new Pole Star crate illustrate Pennsylvania Transformer Company's never-ending concern with *all details* of transformer use . . . from ease-of-handling to efficiency-of-operation. We invite you to write, wire or 'phone for more details.



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Distribution Sales Department

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Pole Star transformers are available in sizes 3 Kva through 500 Kva and in voltages from 480 through 67,000 volts.

APDA Ponders 2 Atomic Sites

Detroit Edison tells Michigan PSC that nuclear group is considering two lake locations for pilot atomic power plant

Detroit Edison Co confirmed earlier stories when it revealed during a hearing before the Michigan Public Service Commission that it hopes to start building a $45-million atomic power plant in about two years. Detroit Edison is working on this project with members of the Atomic Power Development Associates.

Two sites—one at Harbor Beach on Lake Huron and another at Monroe on Lake Erie—are under consideration as location points for the pilot plant, which would house a nuclear reactor of the breeder type.

Output of 100,000 Kw Planned . . . Walker L. Cisler, Detroit Edison president, said the reactor would generate more than 100,000 kw. That would not add substantially to Detroit Edison's present total capacity of 2.5 million kw, but would be enough to serve 250,000 people. As far as is known, that would make the Edison plant the largest now under consideration in the U. S. and the first breeder type reactor of important size in the world.

Detroit Edison asked that the $5 million the company plans to spend on atomic research in the next four years be charged off against operating expenses. Balance of the $45 million would be contributed by Edison's 32 associates, all of which are acting together as Atomic Power Development Associates. Cisler said Edison's proposed $5-million contribution has been matched so far by other firms, so that $10 million already is committed toward construction of the pilot atomic power plant.

According to Dr Hans A. Bethe, professor of physics at Cornell University, who also testified before the MPSC, a model reactor would have to be constructed and charged with atomic fuel to test safety and control factors. That, he said, would take upward of two years. Atomic Energy Commission's Argonne National Laboratory would build the test reactor. Dr Bethe, who has been an Edison consultant on atomic energy since 1953, predicted that breeder reactors eventually will reduce fuel costs for producing 1 kwhr from the present 3 mills to less than one-hundredth of a mill.

Breeder Reactor Favored . . . Detroit Edison, according to Charles H. Landrigan, executive vice president, told the PSC that the company believes the breeder reactor eventually will produce so much excess atomic fuel that the fuel consumed to make electricity will cost practically nothing.

By April 1, the Edison group will submit a proposal to build the reactor to the AEC. Once authorization is received and the Edison group has firmly decided how to proceed, it is possible that the plant could be in full operation in four or five years.

Pacific G&E Adds 3-Millionth Meter

Norman R. Sutherland, vice president and general manager of Pacific Gas & Electric Co, left, is shown above connecting the California company's three-millionth customer meter to the lines.

The distinction fell to Axel Andersen, a building maintenance engineer, his wife, Lucy, and their small daughter, Carol Ann, 4, as they moved from the Mission district into their new home at 84 Oakmont Drive, Westlake, Daly City.

After pinning an orchid corsage on Mrs Andersen, Sutherland presented the family with a new electric dishwasher as a mark of the importance of the milestone in PG&E's more than a century of growth.

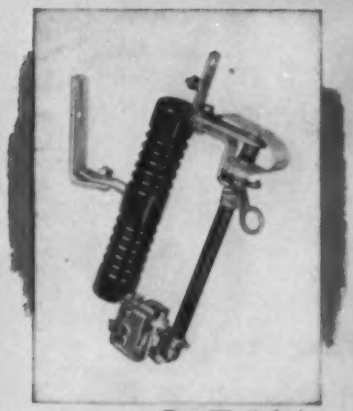
Wind Project Up in Air?

LONDON — (McGraw-Hill World News)—The wind generator project in the U. K. (EW, April 13, 1953, p32) has been temporarily suspended for two reasons: (1) Development has proved more costly—some eight times original estimates—than originally contemplated; and (2) with the advent of the nuclear power program, British Electricity Authority is having second thoughts about the value of continuing with the project. It may later decide to drop the matter entirely unless somebody who is interested has a special problem to which this type of power generation would fit. In this case, BEA would probably ask them to foot the rest of the bill. Even so, it is unofficially understood that the development would take another two to three years to complete.

We've decided to use the **NEW**
S&C OPEN CUTOUT
and save all this bother

Don't waste time on a detailed short circuit analysis—deciding just where heavy duty cutouts are needed. The NEW S&C Type XS can be used wherever you need an open cutout.

S&C OPEN CUTOUTS CAN BE USED FOR BOTH "HEAVY DUTY" AND "STANDARD DUTY" APPLICATIONS



Type XS, single-shot style, birdproof insulator. Also available in three-shot style, and with NEMA insulators.

. . . they give heavy duty protection, but meet standard duty cutout budgets

The increased interrupting capacity of the S&C Type XS eliminates the problem of deciding where heavy duty cutouts will be needed . . . an S&C Type XS can be used in every case . . . for it has an interrupting capacity of 5,000 amperes (7.5 kv rating), and 4,000 amperes (15 kv rating).

It is no longer necessary to carry warehouse and service truck stocks of both standard and heavy duty cutouts. Nor do you have to worry about construction crews installing the wrong cutout at a particular protection point.

All these advantages become economically justifiable because, for the Type XS Cutout, S&C has developed a recoil mechanism that makes it unnecessary to resort to conventional means of increasing cutout interrupting capacity—namely, heavier construction, large bores, and double venting—which not only increase cutout costs but usually sacrifice performance, especially on low fault currents.

Information about the Type XS Cutout is contained in the new S&C Catalog Section 511 . . . we will gladly send one at your request.

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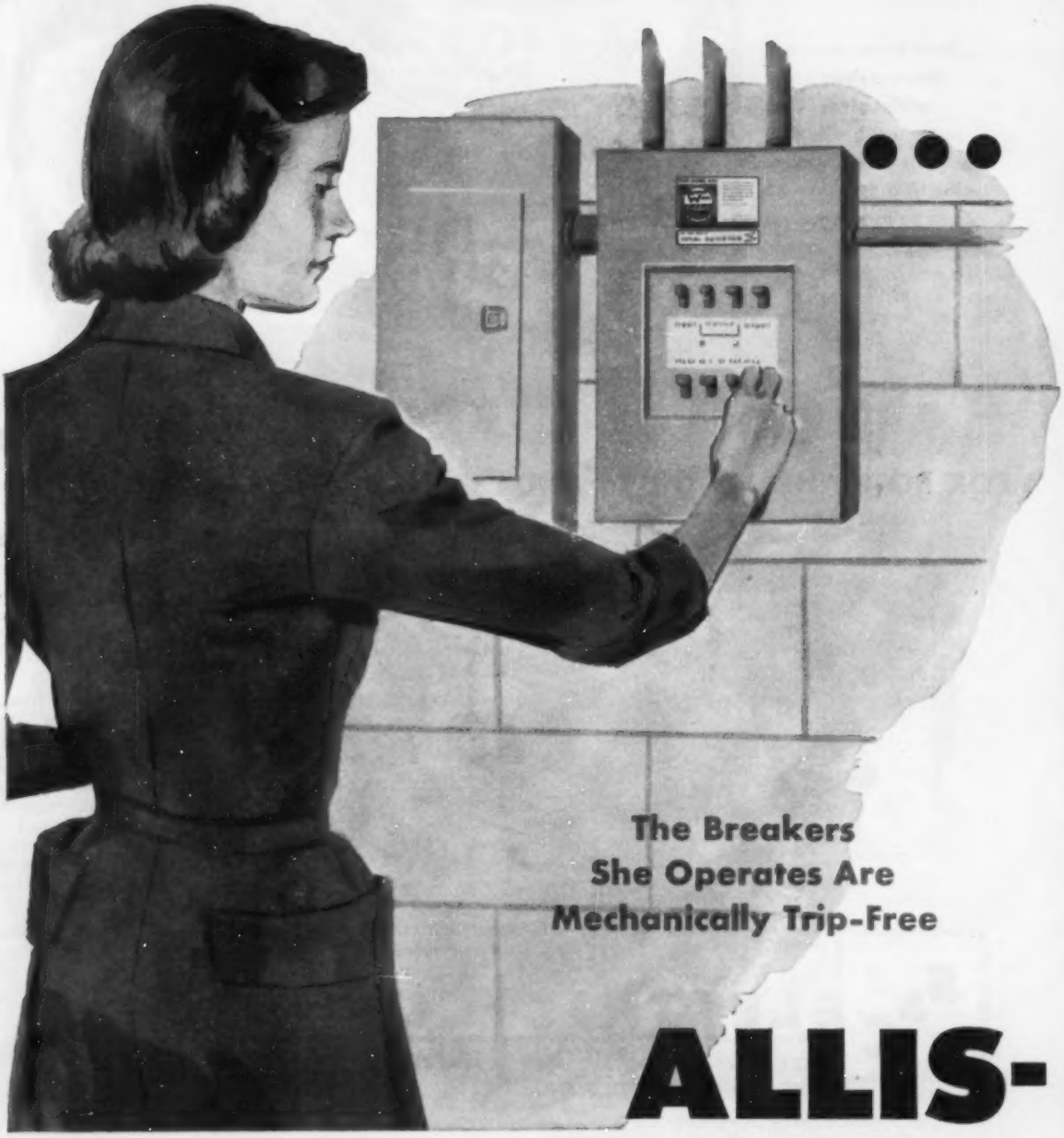

The Breakers She Operates Are Mechanically Trip-Free

ALLIS-

are Trip-Free are yours?

The breaker shown is 230 kv, 10,000,000 kva.

Only Allis-Chalmers builds *all* breakers mechanically trip-free *without qualification*. Only in mechanically trip-free breakers are contacts and mechanism uncoupled — enabling contacts to open without restriction from mechanism.

For information call your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

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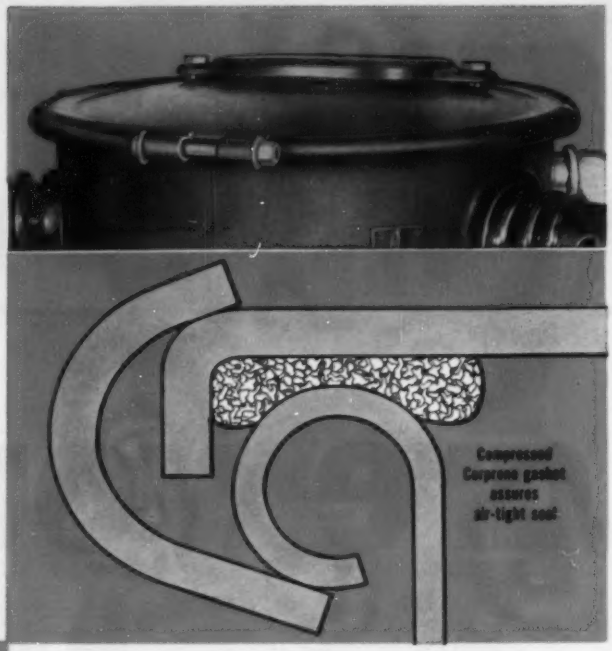
SHUR-SEAL COVER

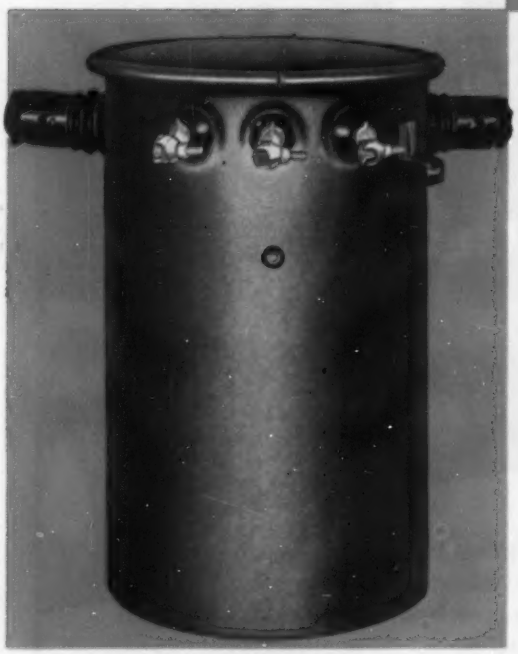
adds extra years of service life to

Wagner®

Form W

Distribution Transformers!





Write for your copy of Bulletin TU-180. It gives complete information on Wagner Distribution Transformers.

Wagner Form W Pole Type Distribution Transformers last years longer than many similar transformers on the market today for many good reasons. Among them is the fact that Wagner Transformers don't "breathe." They're sealed air-tight.

How? Wagner's exclusive Shur-Seal Cover is fitted with a clamping ring which maintains a uniform pressure, holding the cover tight to the tank. Although as air-tight as a welded tank, the cover may be removed by simply loosening a single, stainless steel bolt. No atmospheric moisture or dust particles can get inside. The inhibited oil used in Form W Transformers reduces oxidation to a minimum and retards the formation of acids and sludge which would eventually cause deterioration. Working together as they do, the Shur-Seal Cover and inhibited oil add years to the service-free life of Wagner Form W Distribution Transformers.

Other features of Wagner Form W Distribution Transformers...

HIGH VOLTAGE SIDEWALL BUSHING... for faster, easier, safer *permanent* connections. Lineman simply pushes conductor into the connector and tightens with a few twists of the knob. No tools are needed and the lineman is protected from accidental shock by the insulated knurled knob.

LOCKED LOW VOLTAGE BUSHING... Linemen never need worry about loose connections on the inner end of the terminal studs because the new, low voltage bushing assembly makes it impossible for these studs to turn when the terminals are being tightened. This feature also makes it safer for the lineman when connections are being made to the terminal.

FORM W TRANSFORMERS COME TO YOU IN DRUMS... Wagner Form W Distribution Transformers from 3 to 10 kva are now packed in sturdy, fiber drums for ease of shipping, handling and storage. Each drum is sealed so that when it is opened, the transformer is as clean and free of harmful foreign particles and grease as the day it left the Wagner plant.

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ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

T55-6

CONFERENCE CHAIRMEN GET TOGETHER. Left to right, for IES, Kirk M. Reid, General Electric; for Edison Electric Institute, J. W. Anderson, Philadelphia Electric; for National Shade Tree Conference, E. H. Scanlon, consulting arborist

Trees and Utilities Can Exist in Peace

Arborists, street lighting engineers, and utility authorities meet at Cleveland and study problems brought by street trees of wrong kinds or improperly planted

Traditional conflicts among street trees, street lights, and overhead power and telephone wires can be resolved. Trees and utilities can live in peace. This is entirely possible if planned tree planting and maintenance programs are guided by the cooperative efforts of city foresters and street lighting and utility authorities.

These were among the conclusions to be drawn from the first nationwide Street Tree and Utility Conference held, March 3-4, at Cleveland. Sponsors of the conference were Edison Electric Institute, Illuminating Engineering Society, and the National Shade Tree Conference. The meeting brought together for the first time some 300 arborists, lighting engineers, and telephone and electric utility authorities.

In two days the conference focused expert attention on the tree problem that was pointed up sharply when the 1954 hurricanes brought down on utility lines throughout the Northeast over-age, damaged, and disease-ridden street trees.

Remarkable agreement on both objectives and the means of achieving them marked all sessions. It was apparent that all three groups believed today's tree problems had to be and could be solved. But they saw the solution only by mutual cooperation and concentration on a program keyed to public acceptance of planned tree planting.

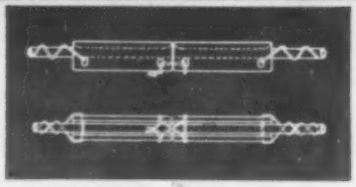
The two 1954 hurricanes brought to many men in public life their first serious thoughts about shade trees, John L. Rego, director of agriculture and conservation of Rhode Island, said. Now we must sit down with experts and work out a long range program designed to remove "giants of destruction" from our streets and to replace damaged and diseased trees on a continuous basis.

It is to the utilities' advantage to direct and even finance such programs. Unquestionably utilities which go into this field will save money later in tree trimming costs, Rego said.

Such a program of cooperation was described by Harry T. Sealy, vice president, Cleveland Electric Illuminating Co, which makes services of its consulting arborist available to any community it serves which wishes to develop Master Street Tree Plans. Also offered is a complete tree program including expert aid in setting up means and techniques for organizing and financing such programs,

(*Continued on page* 27)

LINEMAN—SPARE THAT TREE!



PINCO TREE INSULATORS provide maximum, permanent protection for tree, wire and service

Up until Pinco Tree Insulators were introduced, beautiful trees such as these majestic Eucalyptus were becoming daily casualties to ever-expanding power lines. Today, thanks to Pinco foresight and pioneering, Pinco Tree Insulators provide the answer to an old and troublesome problem—permitting utilities to string lines *safely* without marring the beauty of cherished landmarks.

The super-hard, super-smooth surfaces of Pinco Tree Insulators resist the abrasive action of trees, branches or other obstructions. And their mechanical strength is such that, on test, they withstand repeated side hammer-blows up to 100 inch pounds without failure! The porcelain itself . . . produced by the Pinco Wet Plastic Process, guarantees high dielectric quality.

In service, Pinco Tree Insulators have conclusively proved their superior efficiency, durability and economy. Many users state that they *save their original cost every year!* May we submit facts, figures and samples to prove this point to *you?*

THE PINCO TREE INSULATOR is attached directly to the wire it protects—unaffected by the sway of limbs; remaining permanently in place. It may be used singly or in multiple. The diagram above shows the method of attaching two or more to the conductor. An installation methods sheet is enclosed in each carton.

THE PINCO TREE INSULATOR NO. 3600
for power and light primary and secondary, power and light services, etc. (cable up to 1" diameter) . . . is made in 12", 14" and 16" lengths. Other models are available for heavier or lighter service.
U.S. Patent No. 2,361,109

PINCO INSULATORS
RIGHT ON THE JOB

The Porcelain Insulator Corporation
LIMA, NEW YORK

For complete information regarding Pinco Tree Insulators and Guy Strains, refer to Pages 46-51 of Pinco Catalog No. 49—or contact the Joslyn Mfg. & Supply Co. office in your locality.

THREE VIEWS OF TREE PROBLEM were presented: For arborists by C. A. Young, Jr, city forester, Baltimore; for street lighting experts by Stanley T. Siegel, National Safety Council; and for utilities by G. E. Dean, Public Service E&G

DESIGNING FOR TREES AND STREET LIGHTING was discussed by W. H. Edman, Holophane, and H. W. Osborne, City of Buffalo; other tree problems by S. S. Baxter, City of Philadelphia; F. Woodland, AT&T; E. V. Sayles, Consumers Power

model legislation, master planting program, a maintenance plan for new and old plantings, and organization of basic equipment needs.

Booklets Promote Programs . . . Also part of the CEI program is a 16-page, 4-color brochure, "Trees You Can Live With," designed for use by people responsible for tree planting in the company service areas.

A booklet of similar character, "Trees," published by Southern California Edison Co, was distributed to 15,000 persons last year and will reach 50,000 in 1955, R. E. Dahlin reported. It is used in Los Angeles schools having classes in horticulture and agriculture.

As a result of the selective tree planting program of the Pacific Gas & Electric Co, E. G. Stahl said, 34 of 156 incorporated municipalities have adopted tree ordinances. Forty-eight more have them under consideration. Most of PG&E's promotion in the last 16 months was directed, he said, toward passage of such ordinances in every community served. Such ordinances contain provision for exclusive adoption of PG&E's recommended tree list and provision for a program of removal of undesirable trees.

Cooperation between utility designers and the arborists or foresters through the exchange of information was urged by E. V. Sayles, Consumers Power Co. Information exchanged should cover:

1. Long range planning of overhead systems and circuit locations.

2. Short range planning of overhead construction in relation to trees.

3. Clearance between trees and wires.

4. Effect of pole height on cost of construction.

5. Use of high-voltage aerial cable.

Exchange and discussion of such information would be certain, Sayles believed, to establish a spirit of cooperation and a recognition of problems and situations previously unknown.

A substantial contribution to mutual understanding of "Why Overhead Lines on Public Street?" was made by George E. Dean, Public Service Electric & Gas Co. The answer, he said, is "because it is the best engineering solution." The hard economic facts are that pole lines on public streets cost less to build, can be maintained at less cost, and can be restored to service easier and more quickly than those on rear lot lines.

In addition it would cost an estimated $1.1 billion to put all 9,400 miles of overhead circuits of Public Service E&G underground. An additional $15 million annually would be required to reinforce such circuits. These investment and maintenance charges, Dean said, could be supported only by monumental increases in electric service rates.

Street Lighting Needs Tree Trimming . . . Relationship of trees and street lighting was accented in a paper by David Baldwin, National Safety Council, but read by Stanley T. Siegel. While the natural function of street lighting is to reduce crime and accidents and promote civic pride, no street lighting installation is properly designed or installed unless it has been coordinated with trees. Nor is street lighting properly maintained unless trees are properly maintained.

Proper pruning of trees can improve the effectiveness of a street lighting installation from ⅓ to ½, according to a joint presentation by W. H. Edman, Holophane Co, and H. W. Osborne, City of Buffalo. Such gains, they said, are most important in residential streets where high mounting height and wide angles of cutoff are necessary for economy of first cost.

When street lighting and foliage clash, careful cost analysis is vital. It is far more economical to prune tree foliage than to alter street lighting design. Moreover only about 50% of street lighting mileage is in areas where foliage interferes, they said.

Disaster Brings an Opportunity . . . The huge cost of removing and replacing trees killed by Dutch elm disease today is a major financial burden for cities. But at the same time they have an opportunity to start a planned tree planting program, Edward H. Scanlon, consulting arborist, Cleveland EI, told the conference. He urged that the public be educated away from forest giants and toward trees of right kind, shape, and size for the space available.

Backing this view, J. A. Dietrich, superintendent of trees, Greenwich, Conn., said the time has come to review conceptions of street trees. Wisely selected trees, properly placed and well maintained, can be an asset. Wires and trees can live together if consideration is given to species selection and planting location.

DISTRIBUTION
TRANSFORMERS

ATANA*

2. EASIER TO CHECK—
NEW HANDHOLE DESIGN

1. EASIER TO HANDLE—
BECAUSE THEY'RE LIGHTER

Picture story of a lineman making

BIG SAVINGS ON INSTALLATION

Time and money can be saved when installing distribution transformers. Ask the man who puts them on the pole! He'll tell you that General Electric transformers make his job easier in four ways.

Easier to handle. Lighter weight of G-E transformers means easier handling in warehouses, on trucks, and where it counts most—on the pole. Since 1937 G.E. has cut the weight of many ratings almost in half!

Easier to check. Only a screwdriver is needed to remove or tighten the single bolt which holds the one-piece cover band and the handhole cover. The nitrile rubber gaskets—another G-E exclusive—can be re-used again and again.

Handles copper or aluminum. No special fittings are needed because tin-plating of the terminals and built-in spring tension lick both the corrosion and the "cold-flow" problems of aluminum conductor.

More clearance, G.E. has shrunk sizes as well as weights. Lower heights mean big dollar savings because existing transformers can be replaced by larger ratings without changing poles. 431-21

CONVENTIONAL—SELF PROTECTED
take your choice
General Electric makes both

*ATANA. Your lineman probably know better than anyone else that *All Transformers Are Not Alike.* General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Today's Fuel Costs Make It Important to Know How . . .

Modern Methods Cut Coalpile Losses

Correct sealing methods, careful site location, and use of mechanical equipment can prevent spontaneous combustion and reduction in heat value of coal

P. W. ZIEMKE, Oak Ridge, Tenn.

Correct sealing methods, locating of piles, and handling will lessen the possibility of spontaneous heating of stockpiled coal and the resulting reduction in Btu value and possibility of combustion.

Factors contributing to coal ignition in stockpiles are:

1. The iron pyrite content of the coal. This substance, found in most coals, is heavy in sulphur and light in iron. The sulphur with water under pressure and circulating air forms sulphuric acid which acts as a catalyst to begin the cycle of decomposition that ends in fire.

2. Initial temperature of stored coal.

3. Size of coal and distribution of sizes when placed in storage.

4. Quality of coal. Better grade coal rarely loses more than 1% of its heat value per year while poorer grades initially lose 3% per year and 5% for succeeding years.

The effect of these factors can be controlled by the application of the techniques mentioned above.

Sealing Methods . . . Two basic methods are advocated. Loose piling is acceptable for small stockpiles because it permits unrestricted flow of air through the pile. This maintains a uniform temperature by removing the heat of oxidation as speedily as it forms.

The second method is sealing of the mass by compaction with heavy dirt moving machinery. This latter method is recommended as it reduces the loss of heat values in the coal and provides safeguards when recovery methods are used.

Site Selection . . . The stockpile should be located on a site having good natural drainage. If so located water will not accumulate, and thus sulphuric acid and eventually spontaneous combustion will not occur. If natural drainage is not possible, drain tiles must be installed to handle the run-off soil water, rain, and snow. After this drainage is in place, the area should be leveled with graders and bulldozers to form a hard compact base for the coal.

Where wood is not expensive, some operators lay a deck of No. 3 grade plank. This minimizes dilution when coal is mechanically recovered. Small crushed rock is also sprinkled and compacted in a manner similar to that used building a country road. Asphaltic concrete, or even concrete, is sometimes laid to form a floor that prevents dilution and absorption of water from below.

Crushing . . . Coal delivered with a fair quantity of lump should be crushed before stockpiling. This is particularly important where endless belt conveyors discharge the coal from an elevation. This falling from height develops segregated or stratified layers with fines going to the center of the pile and the lump going to the outer edges. Where the pile is built out from a center, the bulky material

forms a rill at the bottom of the mass. This loosely compacted portion acts like a wind tunnel supplying unwanted oxygen to the entire pile.

Equipment . . . Several methods of loading the scraper can be used, such as conveyors direct from initial storage bins (either clamshell or conveyor filled), clamshell direct from railcar or barge, or pusher loading the carryall from a temporary pile built up at the unloading point.

Dozer-spread coal should be laid in thin layers to take advantage of the compaction offered by the equipment itself as it moves to and fro over the pile. Rubber-tired equipment is very effective for this type of work. It can also push coal to the storage pile at distances up to 500 ft.

Adding wings to the blade increases the dozer's capacity when handling light coal. These wings can be attached temporarily by bolting or permanently by welding. With the extensions in place 4 to 7 tons can be moved per trip, the amount depending on the weight of the dozer and the size of the wings.

Maintaining the Spread . . . The build-up of controlled layers of fuel should be watched when using carryalls. Conditions will vary according to the weather; but unless succeeding layers are sprayed, 6-in. layers are usually maintained. Twelve inches is the maximum for optimum conditions for compaction. The important thing is the elimination of air from the mass because it hastens oxidation and increases the probability of slacking, loss of heat value, and probable fire.

Coal, when properly compacted by controlled methods, will stand with solid, vertical walls which will permit shedding water. Segregation is more pronounced at the slopes of the pile. This weakness enables winds to penetrate more readily at these points.

Tests indicate that carryalls can compact coal in the bottom 20 ft of a pile to a density of 65 to 70 lb per cu ft. This compares favorably with 58 lb per cu ft in an uncontrolled compacted pile and 50 lb per cu ft for loose coal.

Crowning the Pile . . . It is good practice to crown the pile top at the close of each day's work and on completing the pile. Building up the area with a symmetrical contour eliminates water absorption and prevents rapid run off.

LARGE EARTH MOVING EQUIPMENT can handle 50 to 100% more fuel per hour than other means at less cost. Spreading and compaction are more effective

Stockpiles with saucer shaped tops are bad as in these depressions unwanted water accumulates during heavy rain.

Reasonable grades facilitate fast coal transportation. Grades above 8% should be avoided even if switch backing must be used. Running an occasional trip over the haul road with the dozer, especially in bad weather, will speed operations and reduce equipment repair costs.

Roofing . . . A supply of fines intermixed with heavier, bulkier coal, asphalt, or oil should be spread as a "roof" over the completed mass. Fine coal alone seals the mass and usually provides adequate cover for short term storage.

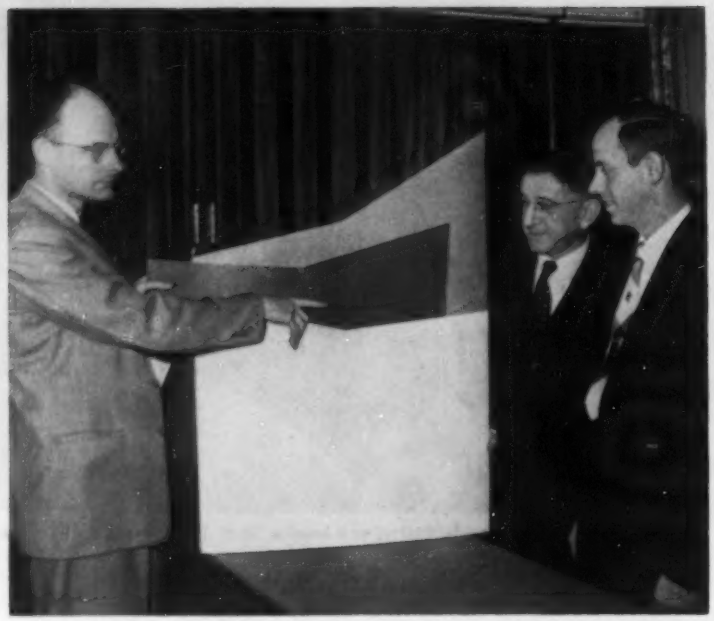
Air leaks can be readily detected as the temperature drops in the fall because the warm vapors condense on reaching the cooler, outer air. If detected, these potential trouble spots can be fixed by adding fines, followed by compaction. One large AEC-operated plant takes monthly temperature readings of its coal pile by dropping thermocouples down previously installed vertical pipes.

Reclaiming . . . The same versatile earth moving equipment used for stockpiling is best for reclaiming. It provides quick and economical transportation. Haul routes should be layed out so the grade always favors the load. For fast, big pay loads a dozer should add the final push as the scraper is engaged in making its deepest cut. Between pushes the dozer should trim up the banks and prepare new haulage routes as old ones are eliminated through coal removal.

Combustion . . . When excessive steaming occurs or fire actually breaks out, little can be done by streaming water on the thickly bedded stacks as the water usually vaporizes before it reaches the seat of the trouble. Although it is expensive, the only effective technique is to uncover the fire with coal moving equipment and then extinguish it.

It must be remembered that combustion always starts at the bottom of the pile where pressure about the area makes it difficult to get water into the heated sections. Combustion is inevitable if the stockpile temperature reaches 150F. This is quite possible in midsummer when there is heavy absorption of the suns rays by the black coal.

By using the techniques mentioned, it is possible to stock safely large volumes of coal and thereby safeguard continued operations when strikes in mines and on railroads might interfere with the normal delivery of coal. Stockpiling also permits the buying of coal during peak production periods when a choice of many suppliers insures better prices and quality.



CUTAWAY CHART helps J. A. Smith and D. K. Blake, General Electric, demonstrate to R. F. Lawrence, Westinghouse, the effect of lower loss evaluation in

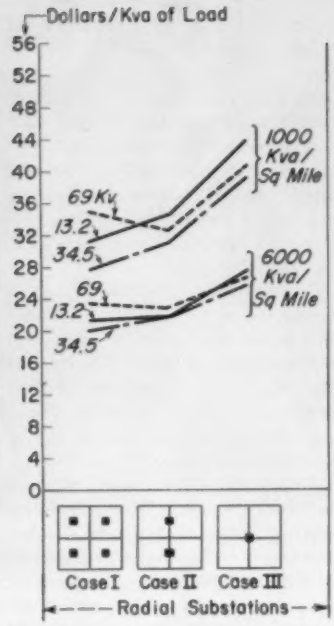


chart above. Here three 4-kv substation sizes are compared for lowest cost

Why Distribution System Costs Vary

Selection of substation sizes is important. When they suit load density, supply and primary distribution voltages, costs are lowest. PEA System Planning Committee told also higher network voltage offers savings

Oversimplification of a distribution system for initial analysis shows why one system plan costs more than another. Experience in applying the basic plan to field conditions tells why one is more practical than another. This approach to distribution system planning led J. A. Smith and D. K. Blake, General Electric Co, to these conclusions:

1. For load of 1,000 kva per sq mile at 4 kv, 3,750-kva single-bank substations and 34.5-kv subtransmission give lowest cost.

2. Double-ending each substation, using 2,000-kva banks, boosts distribution cost. Site problems might swing choice to 3,750 banks.

3. Load growth to 6,000 kva per sq mile favors 5,000-kva single-bank substations and double-ended 5,000-kva banks.

4. Subtransmission at 13.2 kv boosts all costs slightly, mostly by greater line losses, but does not affect choice of substation.

5. Subtransmission at 69 kv narrows substation choice to 7,500-kva single-bank or double-ended 3,750-kva banks at 1,000 kva per sq mile and to 10,000 kva or double-ended 5,000-kva banks at 6,000 kva per sq mile.

6. High real estate costs favor larger substations regardless of subtransmission voltage.

7. Primary networks cost more than simple radial supply but less than double-ended radial systems.

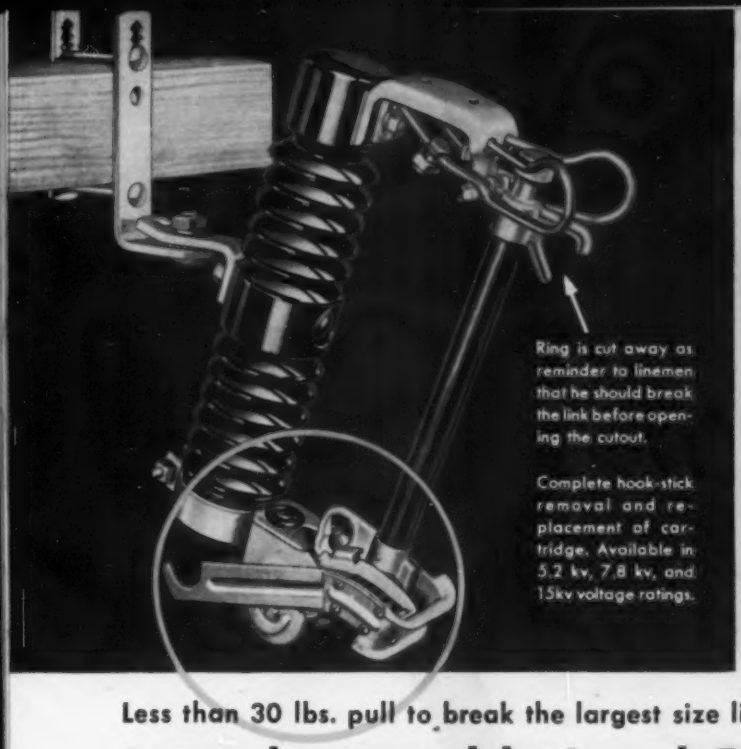
Factoring these comparisons to 12 kv, Blake showed that savings over the 4-kv plan decrease with increasing density unless field restrictions bar 4-kv substations.

This presentation by Smith and Blake illustrates the field covered by Pennsylvania Electric Association's System Planning Committee meeting, Feb. 28-March 1, at Philadelphia. Shorter papers by R. F. Lawrence, Westinghouse Electric Corp, and by many members and utility guests extended the coverage of electric system design.

Advocates 460-V Secondary Network . . . Generalized comparisons and several specific cases prove that higher network voltages save money for the utility serving commercial loads. Locating the transformers in a spot network from which radial circuits serve distributed loads enhances the savings, reported R. F. Lawrence, Westinghouse. Savings by networking at 460 v instead of 208 run about 35% for 460-v loads. Serving 208-v loads through autotransformers does not boost cost above that of conventional 208-v networks.

Lawrence suggested utilities adopt this course:

(*Continued on page* 44)


Ring is cut away as reminder to linemen that he should break the link before opening the cutout.
Complete hook-stick removal and replacement of cartridge. Available in 5.2 kv, 7.8 kv, and 15kv voltage ratings.

Easy pulling action of interchangeable load-break cartridge will break link inside tube, and arc is cleared before tube can drop.

Less than 30 lbs. pull to break the largest size link . . .

Interchangeable Load-Break Cartridge Now Available for L-M's HDO Open-Type Cutouts

Load current is extinguished in the tube. Load-break interrupts all capacitive and inductive loads up through 100 amperes. Fault interrupting capacity 10,000 amperes, 5.2 kv, 7.8 kv, and 8,000 amperes, 15 kv.

By **GEORGE W. COOPER,**
Product Manager
Protective and
Switching Equipment
Line Material Company

L-M's big, rugged 100-ampere HDO open-type cutouts with the new interchangeable load-break cartridges provide outstanding operating and design features that assure you of lasting performance and easy operation.

The load-break cartridge utilizes standard 20-inch distribution fuse links. All links through 100 amperes can easily be broken because of the high mechanical advantage of the link-break lever.

A pulling action of less than 30 pounds is required to break the largest size link. The cartridge is designed to insure a complete break of the fuse link and the complete extinguishing of load current in the tube.

The upper pull ring has been cut away to remind the lineman of the link-break feature. This eliminates the danger of pulling open the cutout, through force of habit, without first breaking the link. If, on second thought, it is deemed desirable to open the cutout without breaking the link, this can be done by engaging the hook stick behind the cartridge.

Principal Features of L-M's 100 Amp HDO Open-Type Cutouts

The HDO incorporates many desirable features, assuring positive action and dependable service. These include:

Completely bird-proof construction.

Corrosion-resistant, high-strength hardware, with 4 to 6 times the life of mild steel.

Current-carrying parts all silver-plated brass or copper.

Cartridge firmly anchored for closing-in on faults; tube cannot move upward; cannot pop out of bottom hinges in closing.

All cartridges designed for complete hook-stick removal and replacement.

Maximum interrupting capacities with any size link. Cutout interrupts any fault current from minimum melting of link to maximum cutout rating.

Tin-plated connectors mounted directly on stationary contacts eliminate several current-interchange points.

Tube cannot miss top contacts, which are heavy silver-plated springs. These make a high-pressure contact with the cartridge.

Positive pressure-controlled expendable cap.

Exclusive wedge-type clamping jaw positively prevents link slippage. Jaw teeth firmly grip link loader—the harder the pull, the tighter the grip.

The complete line includes cutouts in the 5.2, 7.8, and 15 kv classes with a full line of conventional and load-break cartridges in standard and heavy duty interrupting ratings, and a 200 ampere switch blade.

Get Complete Information

Ask the L-M Field Engineer for complete information about L-M's complete line of open and enclosed fuse cutouts and other protective equipment. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

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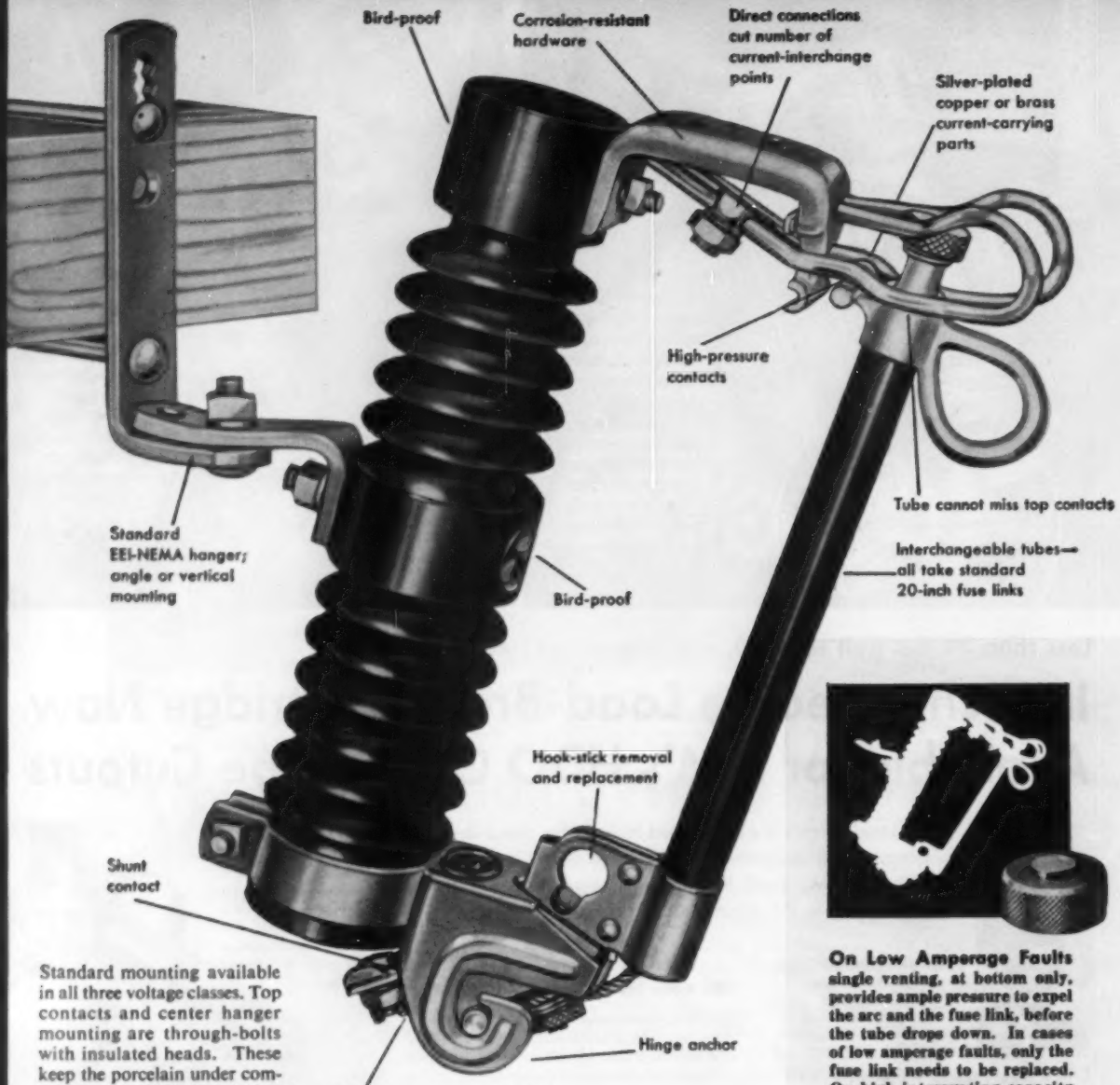
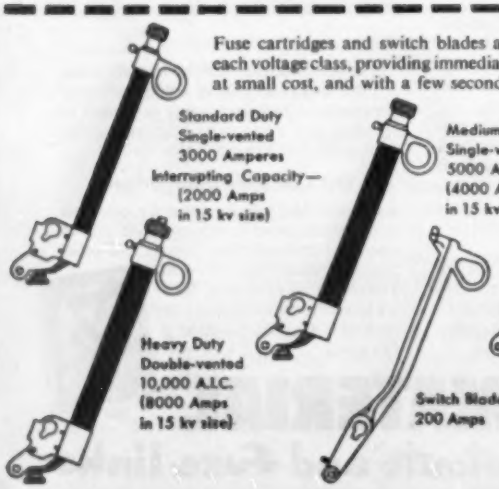
LINE MATERIAL
fuse cutouts and fuse links


Bird-proof
Corrosion-resistant hardware
Direct connections cut number of current-interchange points
Silver-plated copper or brass current-carrying parts
High-pressure contacts
Tube cannot miss top contacts
Interchangeable tubes—all take standard 20-inch fuse links
Standard EEI-NEMA hanger; angle or vertical mounting
Bird-proof
Hook-stick removal and replacement
Shunt contact
Hinge anchor
Direct connections cut number of current-interchange points

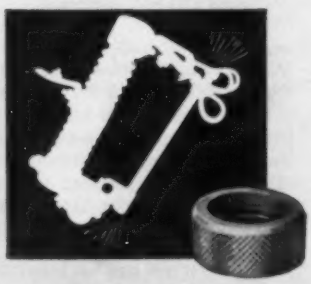
Standard mounting available in all three voltage classes. Top contacts and center hanger mounting are through-bolts with insulated heads. These keep the porcelain under compression, providing added strength and a completely bird-proof design.

On Low Amperage Faults single venting, at bottom only, provides ample pressure to expel the arc and the fuse link, before the tube drops down. In cases of low amperage faults, only the fuse link needs to be replaced. On high interrupting capacity cutouts, the expendable cap, above, right, remains intact, the same as the solid cap.

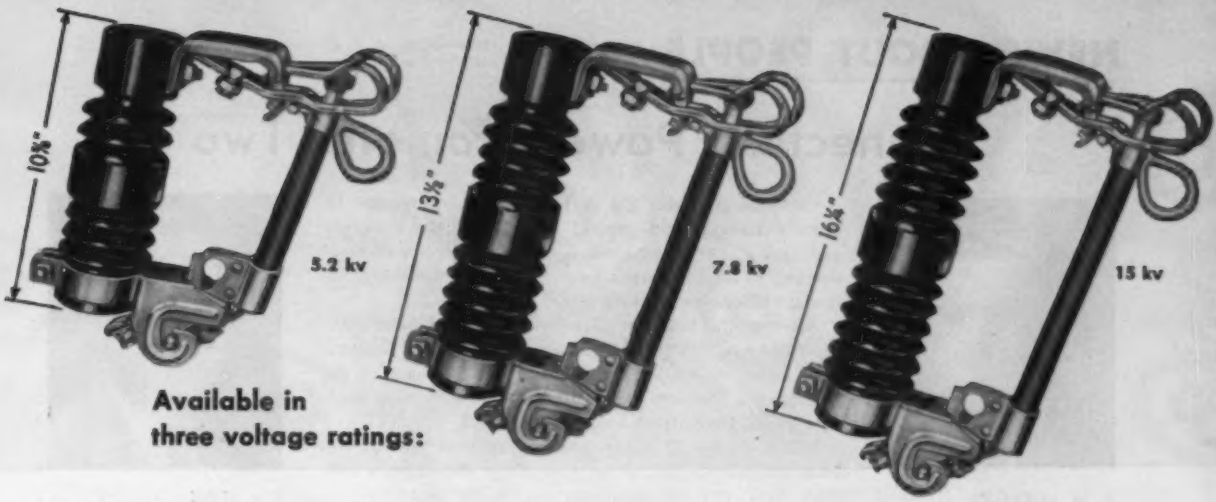
Fuse cartridges and switch blades are completely interchangeable in each voltage class, providing immediate increase in interrupting capacity at small cost, and with a few seconds work with a hook-stick.


Standard Duty Single-vented 3000 Amperes Interrupting Capacity—(2000 Amps in 15 kv size)
Medium Duty Single-vented 5000 A.I.C. (4000 Amps in 15 kv size)
Medium Duty Double-vented 6000 A.I.C. (4000 Amps in 15 kv size)
Heavy Duty Double-vented 10,000 A.I.C. (8000 Amps in 15 kv size)
Switch Blade 200 Amps

Interchangeable load-break cartridges will be available soon for each voltage class cutout. Easy pulling action will break link inside tube, and arc is cleared before tube can drop.



On High Amperage Faults pressure automatically opens the expendable cap at the top to provide double venting. No bursting of tubes. Gas flashover is eliminated because no cutout parts are in the path of gas discharge.



Available in three voltage ratings:

L-M's New "HDO" Open-Type Cutouts... The Cutout Development Of The Year!

New "HDO" 100-ampere cutouts are the simplest, most rugged, easiest to operate in the industry today. Provide high interrupting capacity, bird-proof design; heavy construction, assuring economy.

By R. W. KELLY
Application Engineer
Protective and Switching Equipment Division
Line Material Company

Here's a big new development in open-type cutouts that offers you a tremendous improvement in performance, operation, and economical long life.

The "HDO" is a big, rugged cutout. It is strong, durable. It's the easiest cutout to operate you ever saw. Complete hook-stick removal and replacement of cartridges. Bird-proof construction. Silvered current-carrying parts with few current-interchange points assure ample capacity without overheating. And it operates equally well on high and low fault currents.

Positive Pressure Control

A feature of the "HDO" is L-M's exclusive pressure-controlled expendable cap. On low faults the pressure is confined, assuring consistent, reliable arc interruption. On high faults the diaphragm in the cap opens, relieving the pressure by providing double venting.

Complete Line of Cutouts

Prices for the "HDO" cutouts are extremely reasonable, and the interchangeability feature offers desirable future economies. The complete line includes cutouts in the 5.2, 7.8, and 15 kv classes, with a full line of cartridges in standard- and heavy-duty interrupting ratings, and a 200-ampere switch blade. All cartridges take standard 20-inch distribution fuse links.

Protection That Is Reliable

The many desirable features incorporated in L-M's "HDO" open-type cutout assure positive action, dependable service.

Completely bird-proof construction.

Current-carrying parts all silver-plated brass or copper; this prevents false outages caused by contact heating even after many years of operation.

Cartridge firmly anchored for closing-in on faults; tube cannot move upward; cannot pop out of bottom hinges in closing.

All cartridges are designed for complete removal and replacement with a standard hook-stick.

Maximum interrupting capacities with any size link. Cutout interrupts any fault current from minimum melting of link to maximum cutout rating.

Connectors mounted directly on stationary contacts eliminate several current-interchange points.

Tube cannot miss top contacts, which are heavy silver-plated springs and designed to serve as a guide.

Corrosion-resistant, high-strength hardware has four to six times the life of mild steel.

Get Complete Information

Ask the LM Field Engineer for complete information about L-M's complete line of open and enclosed fuse cutouts and other protective equipment. Or write Line Material Co., Milwaukee 1, Wis. (a McGraw Electric Company Division).

SIZES AND RATINGS

Cartridges	Interrupting Capacity, Amperes 5.2 kv.	7.8 kv	15 kv
Standard Duty Single Venting (Solid Cap)	3000 A.	3000 A.	2000 A.
Medium Duty Single Venting (Solid Cap)	5000	5000	4000
Medium Duty Double Venting (Expendable Cap)	6000	6000	4000
Heavy Duty Double Venting (Expendable Cap)	10,000	10,000	8000
Switch Blade	200 amperes continuous		

All cartridges and switch blades interchangeable in each voltage class.

LINE MATERIAL
fuse cutouts and fuse links

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Connecticut Power Promotes Two

H. W. LAWRENCE

Connecticut Power Co in Hartford has promoted H. Warren Lawrence to general manager of the company and Jack P. Lewis, who will continue as director of engineering, to fill Lawrence's former post as general superintendent of electric operations.

After several years as sales manager with United Electric Light Co, Springfield, Mass., Lawrence joined Connecticut Power in 1935 as assistant to the manager of the Middletown Division. Later, in 1943, he was made manager of the Farmington Valley Division.

Lewis, in his 22 years with Connecticut Power, has been assistant to the acting manager of the division and, since 1947, director of engineering for the company.

J. P. LEWIS

GE Names King to New Post

Martin R. King, formerly General Electric Co's public relations consultant to the employee and plant community relations department, has been appointed advertising manager of GE's Lamp Division in Cleveland.

He succeeds William H. Robinson, Jr, who recently became manager of the division's new miniature lamp department.

After newspaper experience with the New York Times, King joined GE's News Bureau in Schenectady in 1946. He later worked on special assignments for the advertising and publicity department and in 1948 was transferred to the Apparatus Division, also on special assignments. A short time later, he was named manager of the Apparatus News Bureau.

M. R. KING

PERSONAL BRIEFS

Mid South, CVPS

W. Donham Crawford, formerly nuclear engineer with Atomic Energy Commission's Savannah River project, has joined Middle South Utilities, Inc. Among other duties, he will follow nuclear power development for the company . . . Central Vermont Public Service Corp has appointed **Richard L. Gouchoe,** formerly assistant engineer with the operating department, as superintendent of the new power control department.

A-C, Sun Chemical, IES

Allis-Chalmers Manufacturing Co has made these appointments at its Pittsburgh Works: **Milan P. Getting, Jr,** since 1947 assistant to the works manager, was named assistant to general manager; **George Shombert, Jr,** succeeds Getting; and **Sebastian W. Phillippi** replaces Shombert as assistant superintendent of the work's electrical test department . . . **Jerry J. Craig,** assistant treasurer of Sun Chemical Corp since 1947, has been elected treasurer of the company . . . **J. L. Stair,** consulting engineer with Curtis Lighting, Inc, before his retirement in 1948, has been named to receive the 1955 Gold Medal of the Illuminating Engineering Society for outstanding engineering talent and his work in the lighting equipment field. In 1933-34, Stair served as president of the Society.

Koppers, MM&M, Sylvania

W. F. Munnikhuysen, formerly executive vice president of Koppers Co, Inc, has been elected chairman of the company's board of directors, and **Fred C. Foy,** vice president and general manager of Koppers Co's Tar Products Division, has been named president and chief executive officer of the company . . . Minnesota Mining & Manufacturing Co has promoted **Robert V. Holton** from general sales manager to general manager of the company's Electrical Products Division; **Leonard A. Johnson,** formerly sales manager of electrical products, maintenance, and construction trades, replaces Holton . . . **Frank J. Healy,** a vice president of Sylvania Electric Products, Inc, has been elected a director of the company; **Leonard G. Taggart,** Sylvania Electric's director of purchasing, has been named chief purchasing agent.

(*More News About People on page* 39)

Adequate Wiring? FIDDLESTICKS!

This is the old Abernathy place. It was the talk of the town when it was built in 1881. People used to come from miles around just to have a look at it.

The old couple that lives here had the place wired for electricity in 1926. If you were to ask them about adequate wiring, they might say "Adequate wiring? Fiddlesticks! All we ever use are the lights in the kitchen and the parlor and a light in the upstairs hall. Reckon we're adequately wired for that!"

They're probably right too...

But chances are, your company doesn't have many customers like this. Many of your customers probably now have or soon will have 100 amp service entrances in their homes. And a 100 amp service entrance is the cornerstone of adequate wiring.

A home equipped with a 100 amp service entrance calls for a 100 amp capacity watthour meter.

J2 Adequate Meters for Adequate Wiring

- **The 100 ampere, slow-speed meter.**
- **Proven by a year's service.**

THE FIRST WATTHOUR METER WITH

STRAIGHT LINE ACCURACY UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JH55-8

For a busy engineer

some helpful facts about power cable

You, as an engineer and we, as cable makers, are much concerned with the same problem – circuit dependability. The ultimate, of course, would be a power cable circuit that could be installed and forgotten because of its reliable trouble-free performance.

A few premium-quality power cables come close to this and can be depended upon for years of trouble-free service. Made by reputable manufacturers, they are the product of sound research, rigid quality control and long experience.

One such power cable is Rome's RoZone®-RoPrene. Designed for long service life at voltages up to 15,000, it has found wide acceptance based upon highly satisfactory service records.

RoZone® insulation (premium quality, oil-base type) gives you:

High dielectric and impulse strength

Excellent resistance to both corona and ozone cutting

Excellent long-time electrical stability in water

Long life (maintains desirable characteristics for many years)

Versatility (recommended for voltages from 600 to 15,000)

Guarantee of correct manufacture (every foot of RoZone-RoPrene rated at 3,000 volts or over is ionization tested)

RoPrene sheath (rugged, widely accepted Neoprene) gives you:

Strength and toughness (abrasion resistance provides mechanical protection)

Resistance to fire (accepted as standard sheath for mining cable where flame resistance is mandatory requirement of Safety Codes)

Excellent heat resistance

It will pay you to investigate the advantages of this quality cable—RoZone-RoPrene. Write for detailed information. Rome's personalized engineering help on any special cable problem is yours for the asking.

It Costs Less to Buy the Best

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

Personal Briefs

(*Continued from page 36*)

Dr. J. L. Meem, Jr, has been made chief reactor scientist, a new post in the atomic energy engineering department of American Locomotive Co . . . Moody's Investors Service has named **Arthur W. Herrmann,** in charge of the public utilities department, a vice president.

Westinghouse Electric Corp has made the following personnel changes: **Matthew Westphal** was promoted from superintendent of both the miniature and large lamp departments to works manager of the Lamp Division's Trenton plant; **W. W. Morris,** eight years with the company, was appointed director of market research; **George W. Jernstedt,** manager of the special products development section, was named director of a new manufacturing laboratory.

Theodore C. Ohart has been advanced from his post as General Electric Co's retail sales manager of the Lamp Division to manager of marketing for GE's silicone products department; **O. B. Falls, Jr,** former manager of electric utility sales for GE's Apparatus Sales Division, has been named manager of the atomic power equipment marketing study for the Atomic Products Division.

Minneapolis-Honeywell Regulator Co has announced that **Jerome F. Cummiskey,** formerly in charge of commercial sales in Midwest region, has been advanced to market development manager for the Commercial Division and **Charles Sanders,** formerly head of transportation sales, has been assigned as head of a new electronics sales section. Cummiskey replaces **R. H. Jacobs,** recently appointed to the post of sales manager of the Home Products Division.

OBITUARY

Richard A. Rowlands, 64, who retired in 1950 as assistant to the manager of International General Electric Co's Electronics and Merchandise Division, died March 13. Rowlands retired from GE to become Grand Master of Masons of the State of New York from 1950 to 1952.

Changes in Capacity Reported to FPC

PLANT ADDITIONS DURING JANUARY

State	Utility	Plant	Fuel	Capacity (Kw)
Maine	Central Maine Power Co	Dark Harbor	IC	127
Maine	Central Maine Power Co	Jackman	IC	127
R. I.	Narragansett Electric Co	Providence	S	50,000
N. J.	Deepwater Operating Co	Deepwater	S	75,000
Ohio	Shelby Municipal Electric Light Plant	Shelby	S	7,500
Ind.	Public Service Co of Indiana	Wabash River	S	90,000
Minn.	Truman Municipal Light Plant	Truman	IC	700
Iowa	Cedar Falls Municipal Utilities	Cedar Falls	S	5,000
Iowa	Lamoni Municipal Utilities	Lamoni	IC	1,183
Mo.	Marceline Water & Light Dept	Marceline	IC	1,000
N.D.	Montana-Dakota Utilities Co	New England	IC	380
Tenn.	Tennessee Valley Authority	Kingston	S	180,000
Ala.	Tennessee Valley Authority	Colbert	S	180,000
La.	Gulf States Utilities Co	Louisiana 1	S	50,000
Tex.	Southwestern Public Service Co	Denver City	S	40,000
Tex.	Garland Municipal Utilities	Garland	IC	3,700
Wash.	Tacoma Department of Public Utilities	Steam #2	S	25,000

RETIREMENTS

Maine	Central Maine Power Co	Jackman	IC	72
Mass.	Lawrence Gas & Electric Co	Lawrence	H	520
Ohio	Ohio Edison Co	Lake Park	S	12,500
Ohio	Ohio Edison Co	Put In Bay	IC	256
Ind.	Indiana & Michigan Electric Co	South Bend	S	7,500
Ill.	Central Illinois Light Co	Springfield	S	5,000
Iowa	Iowa Public Service Co	Emmetsburg 2	IC	320
Mo.	Marceline Water & Light Dept	Marceline	IC	240
Mo.	Missouri Utilities Co	Cape Girard	S	1,000
Neb.	Custer Public Power District	Seneca	IC	180
Neb.	Consumers Public Power District	Creighton	IC	200
Va.	Appalachian Electric Power Co	Roanoke	S	9,750
Va.	Appalachian Electric Power Co	Glen Lyn	S	15,000
Va.	Virginia Electric & Power Co	Irvington	IC	480
W. Va.	Wheeling Electric Co	42nd Street	S	9,000
S. C.	Lockhart Power Co	Monarch	S	1,500
Tenn.	Kingsport Utility, Inc	Kingsport	S	10,000
Okla.	Marlow Water & Light Dept	Marlow	IC	250
N. M.	Continental Divide Electric Cooperative, Inc	Grant	IC	4,117
N. M.	Kit Carson Electric Cooperative	Taos	IC	1,816
Calif.	Pacific Gas & Electric Co	North Beach	S	25,200
Calif.	Pacific Gas & Electric Co	Station Q	S	16,000

U. S.	Hydro		Steam		IC	Total
Added	0		702,500		7,217	709,717
Retired	520		103,450		7,931	111,901
Adjustments Plus	286,240		250,000		834	537,074
Adjustments Minus	3,800		33,250		585	37,635
Net Change Plus	281,920	Plus	815,800	Minus	465	1,097,255

H—Hydro, IC—Internal Combustion, S—Steam
United States Capacity as of Feb. 1—Hydro 23,466,832 kw; Internal Combustion 2,273,744 kw; Steam, 77,876,735 kw; Total, 103,617,311 kw.

Work on Vancouver Island Cable Link Is Under Way

Preliminary work is now under way for construction of a $5-million submarine cable linking mainland of British Columbia with Vancouver Island, British Columbia Electric Co officials have announced.

Actual construction of 58 miles of land transmission lines to feed electrical power through the cable will begin within a few months. Laying of the undersea section will begin next year.

Cable, is not the longest, but it is unique in that there are no submarine cables carrying so high a voltage, company engineers stated.

Core of the cable which will carry electricity is ⅛ in. in diameter, but thick insulating material around it brings diameter to 5 in.

Core contains four strands, three of which will carry combined total of 132,000 v and fourth, a reserve.

Most of the land transmission lines will be on the mainland side and the submarine section will emerge on the Vancouver Island side of the straits in Nanaimo area.

The lamp and socket swing down as part of the glassware assembly, become automatically de-energized for quick, Service-Safe re-lamping during circuit operation.

The refractor assembly swings wide open on the house side, for easy re-lamping. Refractor assembly can be removed easily but not accidentally.

Make-before-break action of contacts . . .

L-M's New Series Ovalite is Automatically De-Energized with New Service-Safe Feature

Both lamp and socket are automatically de-energized and isolated from series circuit when glassware swings down. Make-before-break action of contacts in series luminaire eliminates arcing.

By **DEAN W. MORRILL**, Lighting Application Engineer, Line Material Company

L-M's new mercury vapor Ovalite offers outstanding design features for safe, economical servicing of the luminaire, in addition to its efficient light distribution.

The lamp and socket swing down as part of the glassware assembly; as the socket leaves the receptacle, it becomes automatically de-energized, and much more accessible for quick, safe re-lamping of the luminaire during circuit operation, saving service time.

Contacts on the series Ovalite are so designed that there is a make-before-break action, which means the lamp connections are shunted before they are disconnected. In restoring the connection the same principle applies. The lamp connection is made before the shunt is opened, eliminating arcing.

The contacts are silver-plated beryllium copper; socket is steatite; receptacle is wet-process glazed porcelain with a 5,000-volt insulation rating which meets EEI-NEMA specification of 19,000 volts withstand.

This new Ovalite provides a choice of horizontal or pendant mounting for mercury vapor; choice of types III or IV light-distribution patterns.

The Service-Safe feature of L-M's Ovalite is available in both multiple and series luminaires.

Get Complete Information

This series luminaire is specifically designed for the Uni-Ballast system. Ask the L-M Field Engineer or Lighting Engineer for information on the new L-M Ovalite; on Uni-Ballast, the most economical system for mercury vapor lighting; and on L-M's Lighting Recommendation Service. Or write Line Material Co., Milwaukee 1, Wis. (a McGraw Electric Company Division).

"Ovalite," "Uni-Ballast" and "Service-Safe" are Line Material Company trademarks.

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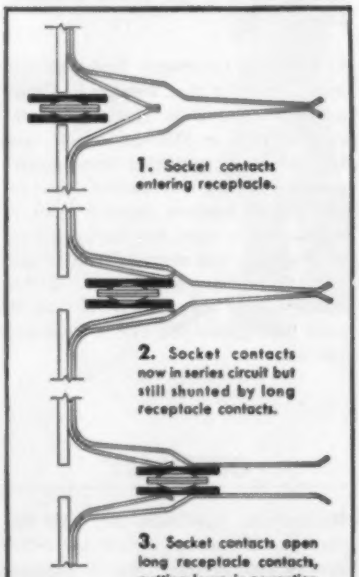
1. Socket contacts entering receptacle.
2. Socket contacts now in series circuit but still shunted by long receptacle contacts.
3. Socket contacts open long receptacle contacts, putting lamp in operation in series circuit.

NOTE—Procedure is reversed when socket is withdrawn during luminaire opening. Lamp is shunted before being withdrawn from circuit. This make-before-break action eliminates arcing.

LINE MATERIAL
Street Lighting

L-M's new mercury vapor Ovalite has high co-efficient of utilization on the street side, with a choice of types III or IV asymmetric light distribution merely by changing glassware.

Lamp and socket swing down, become automatically de-energized for quick, Service-Safe re-lamping during circuit operation.

Wiping-action contacts open circuit on multiple unit . . .

Now Quick Re-Lamping Possible with Ovalite's Automatic De-Energizing Feature

New Service-Safe design automatically isolates lamp and socket from circuit. As luminaire is closed, circuit is completed by means of wiping-action silver-plated beryllium copper contacts.

By **STACY STANDLEY**
Manager of Lighting Sales
Line Material Company

Here's a new feature in luminaire design that offers savings in servicing. L-M's Ovalite lamp and socket are automatically de-energized and isolated to provide quick, safe re-lamping of the luminaire during circuit operation.

The lamp and socket are part of the refractor assembly. On this multiple unit, wiping-action contacts open as the assembly is swung down, isolating the lamp and socket from the circuit and providing easy, safe access to the luminaire. The wiping action keeps the contacts clean.

The Service-Safe feature is also available on L-M's series Ovalite. This series Ovalite has a shunting make-before-break action.

Other Outstanding Features of L-M's Ovalite

Choice of type III or IV light-distribution pattern by simply changing the glassware.

High co-efficient of utilization on street side.

Latch automatically assures positive closing of luminaire when refractor is pushed up.

Both latch and hinge have a spring action to hold the refractor firmly against the gasket, assuring a bugproof, dustproof, and weatherproof seal.

Complete refractor assembly can be removed easily when desired, cannot be accidentally unhooked.

Hood is a smoothly finished one-piece aluminum casting.

One-piece aluminum reflector.

All hardware is stainless steel or non-ferrous metal.

No trapped light at the glassware junction.

Reflector and refractor are easily cleaned.

Get Complete Information

Ask the L-M Field Engineer or Lighting Engineer for information on the new L-M Ovalite, and on L-M's Lighting Recommendation Service. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division.)

"Ovalite" and "Service-Safe" are Line Material Company trademarks.

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LINE MATERIAL *Street Lighting*

POWERS American AERIAL EQUIPMENT

AERIAL TOWERS

Series 7A-01 . . . in sizes for safe, smooth elevation to 21′ or 25′. Equipped with telescopic ladder. Operation from cab or tower. Platform revolves 360°.

HYDRAULIC AERIAL TOWERS

Series TW-2 . . . enables workmen to reach areas more than 35′ above ground. Can be operated from tower or truck cab. Platform revolves full 360°. Telescopic ladder is standard equipment.

REVOLVING Fully-Powered HYDRAULIC AERIAL LADDERS

Series HL-35 . . . elevates, extends, lowers, and retracts by *hydraulic power*. Available in sizes having ground-to-platform height up to 35′. Revolves full 360°.

REVOLVING AERIAL LADDERS

Series 5510 . . . perfectly balanced to permit fast, easy elevation. In sizes having 23′6″, 28′0″, and 30′6″ ground-to-platform height. Can be spotted at angles from 30° to 75°, and revolved full 360°.

HINGED LADDER RACK ASSEMBLIES

Standard and special racks, with extension ladders, can be furnished for installation on Powers-American bodies. These include racks with standard 24′ ladders, and racks with braced or trussed ladders to reach heights up to 30′.

A descriptive bulletin is available on each item of aerial equipment in the Powers-American line. Bulletins, plus prices and complete details, are yours for the asking.

McCABE-POWERS AUTO BODY COMPANY

5900 NO. BROADWAY • ST. LOUIS 15, MO. — 625 CEDAR STREET • BERKELEY 10, CALIF.

MEETINGS CALENDAR

MARCH

EDISON ELECTRIC INSTITUTE—21st Annual Sales Conference, Edgewater Beach Hotel, Chicago, March 28-31.

AMERICAN POWER CONFERENCE—17th Annual Meeting, Sherman Hotel, Chicago, March 30-April 1.

ILLUMINATING ENGINEERING SOCIETY—Southwestern Regional Conference, Ft. Harrison Hotel, Clearwater, Fla., March 31-April 1.

APRIL

ILLUMINATING ENGINEERING SOCIETY—Southwestern Regional Conference, Gunter Hotel, San Antonio, Tex., April 3-5; Inter Mountain Regional Conference, Westward Ho Hotel, Phoenix, Ariz., April 11-13; South Pacific Coast Regional Conference, Statler Hotel, Los Angeles, April 14-15; Pacific Northwest Regional Conference, Harrison Springs Hotel, Harrison Hot Springs, B. C., April 24-27.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Subcommittee on Rubber and Plastics Industries of the Committee on General Industry Applications, Mayflower Hotel, Akron, Ohio, April 4-5; Southern District Meeting, Sarena Hotel, St. Petersburg, Fla., April 13-15.

ATOMIC INDUSTRIAL FORUM, INC—Meeting on "Atomic Energy—The New Industrial Frontier," jointly sponsored by Stanford Research Institute, Mark Hopkins Hotel, San Francisco, April 4-5.

15TH ANNUAL YOUNG MEN'S UTILITY CONFERENCE—Ipalco Hall, Indianapolis Power & Light Co, Indianapolis, Ind., April 6-7.

PACIFIC COAST ELECTRICAL ASSOCIATION—Joint Conference with Pacific Coast Gas Association, Administrative Services and Accounting Section, Jokane Inn, Phoenix, Ariz., April 7-8.

SOUTHEASTERN ELECTRIC EXCHANGE—Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8.

***EDISON ELECTRIC INSTITUTE**—14th Joint AGA-EEI Conference on Operation of Public Utility Motor Vehicles, Netherlands Plaza Hotel, Cincinnati, April 12-15; Industrial Relations Committee, EEI Headquarters, New York, April 21; Hydraulic Power Committee, Atlanta-Biltmore Hotel, Atlanta, Ga., April 25-26; EEI-AGA 1955 National Conference of Electric and Gas Utility Accountants, Conrad Hilton Hotel, Chicago, April 25-27; Meter and Service Committee, Washington-Duke Hotel, Durham, N. C., April 25-27.

NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION—Engineering and Operation Section with Personnel and Safety Section, Davenport Hotel, Spokane, April 13-15.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Spring Meeting, Lord Baltimore and Southern Hotels, Baltimore, Md., April 18-21; Region VIII Meeting, Rice Hotel, Houston, Tex., April 25-26.

NORTHWEST PUBLIC POWER ASSOCIATION—Annual Meeting, Eugene Hotel, Eugene, Ore., April 20-22.

ROCKY MOUNTAIN ELECTRICAL LEAGUE—Annual Spring Conference, Shirley-Savoy Hotel, Denver, Colo., April 24-26.

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS—8th Annual Conference for Protective Relay Engineers, Sponsored by Department of Electrical Engineering, College Station, Tex., April 25-27.

PENNSYLVANIA ELECTRIC ASSOCIATION—Spring Meeting, Meter Committee, Washington-Duke Hotel, Durham, N. C., April 28-29.

CONTROLLERS INSTITUTE OF AMERICA—Eastern Conference, Royal York Hotel, Toronto, Ont., April 28-30.

*MAY

ILLUMINATING ENGINEERING SOCIETY—Midwestern Regional Conference, Edgewater Beach Hotel, Chicago, May 2-3; Canadian Region, Mount Royal Hotel, Montreal, May 12-13; East Central Region, Abraham Lincoln Hotel, Reading, Pa., May 19-20.

EDISON ELECTRIC INSTITUTE—Transmission and Distribution Committee, Statler Hotel, Detroit, May 3-4; Purchasing and Stores Annual Spring Meeting, Dinkler Tutwiler Hotel, Birmingham, Ala., May 8-11; Prime Movers Committee, Biltmore Hotel, Los Angeles, May 9-10; Accident Prevention Committee, Pfister Hotel, Milwaukee, Wis., May 9-10; Industrial Relations Committee jointly with Personnel Administrative Section, Southeastern Electric Exchange, Netherlands Plaza, Cincinnati, Ohio, May 19-20.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Middle Eastern District No. 2, Columbus, Ohio, May 4-6; Electric Heating Conference, La Salle Hotel, Chicago, May 10-11.

PENNSYLVANIA ELECTRIC ASSOCIATION—Spring Meeting, Hydraulic Power Committee, Hotel Sheraton-Brock, Niagara Falls, Ont., May 5-7; Street and Highway Lighting Committee, William Penn Hotel, Pittsburgh, Pa., May 12; Spring Meeting, Systems Operation Committee, Skytop Lodge, Skytop, Pa., May 12-13; Spring Meeting, System Planning Committee, Castleton Hotel, New Castle, Pa., May 16-17; Spring Meeting, Electrical Equipment Committee, Hotel Roosevelt, Pittsburgh, Pa., May 19-20; Spring Meeting, Relay Committee, Abraham Lincoln Hotel, Reading, Pa., May 26-27.

NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION—Business Development Section, Hotel Utah, Salt Lake City, May 9-11.

PACIFIC COAST ELECTRICAL ASSOCIATION—Annual convention, Palace Hotel, San Francisco, May 11-13.

NATIONAL TELEMETERING CONFERENCE-EXHIBIT—Sponsored by Institute of Radio Engineers, American Institute of Electrical Engineers, Institute of Aeronautical Sciences, Instrument Society of America, Morrison Hotel, Chicago, May 18-20.

NORTHWEST PUBLIC POWER ASSOCIATION—Engineering and Operation Section, Monticello Hotel, Longview, Wash., May 19-20.

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS—Spring Meeting, Meter Supervisors, College Station, Tex., May 19-21.

NATIONAL ASSOCIATION OF ELECTRICAL DISTRIBUTORS—47th Annual Convention, Conrad Hilton Hotel, Chicago, May 22-25.

*JUNE

AMERICAN WELDING SOCIETY—Spring Meeting and Welding Show, Hotel Muehlebach, Kansas City, Mo., June 7-10.

EDISON ELECTRIC INSTITUTE—23rd Annual Convention, Los Angeles, Calif., June 13-16.

AMERICAN SOCIETY FOR ENGINEERING EDUCATION—63rd Annual Meeting, Pennsylvania State University, State College, Pa., June 20-24.

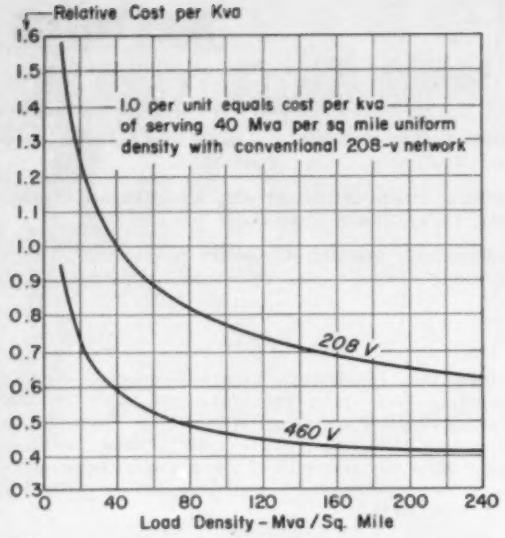
NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION—Accounting and Business Practice Section, Vancouver Hotel, Vancouver, B. C., June 22-24.

AMERICAN SOCIETY OF TESTING MATERIALS—1955 Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-July 1.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Summer General Meeting, New Ocean House, Swampscott, Mass., June 27-July 1.

*Additions this week.

THIS AREA in Philadelphia will be converted from 2 to 3 phase, L. N. Dabundo tells J. A. Thielman and W. A. Osterle



SECONDARY NETWORK INVESTMENT is cut sharply by designing a system for 460 instead of 208-v distribution

Why Distribution System Costs Vary

(*Continued from page* 32)

1. Offer higher secondary voltage to customers who stand to save building investment as long as it does not boost utility cost.

2. Make a complete analysis to determine the best overall plan for system expansion to establish policy on which loads should be served at higher secondary voltage.

He warned that study of each individual case might develop inconsistencies and lack of a service voltage policy.

Gain Capacity by Boosting Primary . . . Conversion of primary supply to 3 phase for Philadelphia's 2-phase area adds 50% to feeder and substation capability at a cost so low that it will be recovered in 8 to 12 years, said L. N. Dabundo. Policy is to retain 2-phase service to secondary customers by Scott-connected distribution transformers. Existing primary customers will receive 2-phase in similar manner, but new primary customers will be connected 4 kv, 3 phase. About 110,000 kva has been converted, and the program will add 275,000 kva by 1960.

Mounting difficulty in procuring sites for distribution substations in urban areas induced Pennsylvania P&L to reconsider its policy of 4-kv distribution. Conclusion is that 12 kv will be used in a growing residential section of Allentown to avoid erecting a new substation. Advantages, said W. U. Baum, are:

1. Conversion can proceed in small steps over five-year period.

2. Accumulated cost is less for 12 kv, and the additional expenditure of $50,000 for a second substation the 7th year is avoided.

3. Ability to retain 1-ph distribution at 12 kv gives better appearance and eases clearance difficulties.

4. Reliability of 12 kv should be better because line exposure is less.

Secondary distribution voltage is being raised in Philadelphia to 120/240, reported J. W. Gallagher. Reasons are 2 to 9% gain in capability, improvement in operation of fluorescent lighting and heating devices, and compliance with EEI-NEMA Preferred Voltage Ratings. Taps on distribution substation banks and feeder regulators are the means for boosting voltage. Overexcited transformers and regulators will be derated or replaced if necessary, but none has exceeded tolerable limits yet.

Save by Delaying Substations . . . Distribution planning for Public Service E&G frequently starts with providing one 26-kv subtransmission line into the new area which operates initially at 4 kv, said Dolph Wappler. Second step is another similar line from a different distribution substation. When load outgrows this capacity at 4 kv, two 26-4-kv transformers are installed at a site reached by the new lines which are then converted to 26-kv operation. The final step, adding a 26-kv tie breaker between the two lines, completes a fully-automatic substation. Substantial savings accrue in carrying charges on the deferred investment.

Acceptance of EEI-NEMA standards for taps and other characteristics has already saved Duquesne Light $30,000, said V. E. Hill. And review of system voltage requirements shows few locations where their taps are not adequate. These are handled by relocating older units with extended tap ranges. That system has 81 unit-type radial substations, added C. M. Stearns. Second supply to 14 of these has been deferred because of high cost or rights-of-way delays, deferring an expenditure of $900,000. Supply interruptions have averaged 58 min per year greater than for non-automatic two-supply units.

Distribution substation transformer capability on the

(*Continued on page* 46)

Practical service training at Honeywell's school...

makes your instrument men more valuable

YOUR instrument maintenance men can get a real education in the most up-to-date methods for servicing instruments, at Honeywell's Training School. Any organization which uses Honeywell instruments can send maintenance personnel to this school. Tuition costs you nothing, for this school is maintained as a "plus-value" service to Honeywell customers.

Thousands of technicians have either started or augmented their instrument knowledge here. A variety of courses is available, to fit men for the particular kind of maintenance problems they may encounter in their specific jobs. The comprehensive course . . . one of the most complete and intensive offered anywhere . . . covers about thirteen weeks. Other courses cover five weeks and less, to offer condensed instruction of either a basic or "refresher" nature to men who can't be spared for extended periods.

There's nothing academic about this school. The emphasis is placed on practical knowledge. Theory through lectures and textbook study is liberally supplemented by laboratory sessions and actual bench work on all types of instruments and related equipment.

One caution: classes have to be limited to assure thorough attention to all students, so make reservations in advance. Your local Honeywell office will be glad to make arrangements. Call today . . . it's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

Why Distribution System Costs Vary

(*Continued from page* 44)

Pennsylvania P&L system has been boosted 600,000 kva by using inherent capacity to the thermal limit, said W. U. Baum. This gain comprises 4% margin under 55C average winding rise, 8 to 32% for low average ambient temperatures, and 12.5 to 15% for daily load factor. Emergency ratings are boosted still higher by accepting 2% loss of life, providing fans after 24 hours, and replacing a damaged transformer within five days. Baum estimated savings at $500,000 in five years.

Substantial savings in investment and carrying charges can be achieved by using switched primary capacitors on distribution circuits in lieu of regulators at the substation, said J. J. Ray, Philadelphia Electric. Analysis of typical circuits demonstrates ability to satisfy voltage requirements of both urban and suburban areas.

Other methods for economizing at the substation included use of motor-operated air-break switches to sectionalize subtransmission supply instead of oil circuit breakers. This method, said W. H. Osterle, has been used extensively by West Penn Power to save about $25,000 per substation. Initial investment can be held down for a two-bank substation, said Dolph Wappler, Public Service E&G, by using the spare 4-kv breaker for bus tie. This postpones expenditure for the subtransmission tie breaker until load approaches two-bank capability.

Cut Bulk Substation Costs . . . Introduction of 750-Mva metal-clad breakers, with first installation scheduled for 1956, permits construction of larger area substations at lower cost per kva, said D. K. Blake, GE. Use of these new breakers permits two-transformer stations up to 95 Mva firm capacity, compared with a previous high of about 58 Mva. And ring-bus connection of three transformers can carry up to 127 Mva. Both cases show appreciable savings over previous practices. Similar breakers rated 1,000,000 kva are feasible, Blake said, but analyses show higher station cost per kva.

Auxiliary buses on the 22-kv side of new bulk power substations are omitted by Duquesne Light Co, reported C. M. Stearns. Experience indicates considerable investment savings with very little increase in maintenance cost. And J. S. Maloy reported that normal design for West Penn Power depends upon motor-operated grounding switches and momentarily deenergized air switches to clear 15 to 40-Mw bulk substations from 132-kv transmission.

A new technique in analyzing service interruptions was described by W. C. Lutz and H. G. Dowey, Philadelphia Electric. Their system uses business-machine punch cards to tabulate and classify secondary customer outages. Typical results showed annual average of 4.83 interruptions totalling 104 min for rural customers served by single-bank substations. Similar data for multi-bank metropolitan substations were 0.42 interruptions and 6.73 min.

Distribution circuit analyses on the Pennsylvania P&L system guard against difficulty in picking up load after an interruption, said J. E. Treweek. Steps involved are (1) determine which circuits are critically loaded, (2) evaluate pickup capabilities and provide necessary sectionalizing facilities, (3) instruct personnel . . .

. . . Economic Gains Come Also from Improved Operation

The search for economic gain by different means was pursued by Pennsylvania Electric Association's Systems Operation Committee at its meeting, Feb 24-25, at Reading. Focus here was economic dispatch of generation for interconnected systems.

Description of the derivation and use of pre-calculated curves by Ohio Edison Co to achieve the lowest incremental cost of power delivered to the load (EW, Nov. 29, 1954, p80) opened the presentation. J. L. Winans said his company has found these curves, derived from loss formulas, are convenient to use. They also give the dispatcher operating information comparable in accuracy to telemetered data. Savings are estimated at $60,000 per year. In discussion, Winans added that system changes will require recalculating the curves about once in six months.

Computers Save Fuel Expenditures . . . Evaluating transmission losses by use of the penalty factor computer is expected to save American G&E over $200,000 annually, reported Dr L. K. Kirchmayer, General Electric Co. This computer is a straight electrical analog which gives the power dispatcher factors to represent system losses in using an incremental slide rule for generating economy. Opportunity for savings by such techniques is greatest for system loads below the peak but above the minimum, added G. W. Stagg, American Gas & Electric Co. That is the area for greatest discretion by power dispatchers. Automatic dispatching can easily develop from the penalty factor concept, added Kirchmayer.

Coordination of power supply facilities by use of the "Early Bird" is saving the Southern Co system $20 per peak-load hour and $40 per hour of off-peak periods (EW, Jan. 10, p62). E. D. Early described the method by which transmission loss formulas are applied to telemetered system data in order to permit a meter on the computer to show "Incremental Cost of Delivered Power." Push buttons make this figure available for each generating plant and interconnection. The computer was planned to control generator loading automatically. Steam plants with total capability up to 1,800 Mw will be controlled by 1956.

Design of still another computer was described by Dr E. L. Harder, Westinghouse Electric Corp. This device will schedule generation, allowing for tie-line interchange; compute incremental cost for any generation schedule; and properly represent shifting load centers. Harder said automatic system generation control is entirely practical with his method but will not be incorporated in the first installation.

Economy Transfers Have Limits . . . Warning against excessive use of economy transfers was sounded by P. J. Davies, Pennsylvania Power & Light Co. System disturbances, such as transient instability, cascading, even fusing of conductors, can come from critical conditions set up by such operation, he warned. Systems usually provide protection against these in their internal design; but when operated as part of an interconnected system, precautionary provisions may be ineffective.

Check the advanced features

of the new ELLIOTT Synchronous Motor

FOR EASIER INSPECTION and maintenance of Collector Rings. Rectangular frame with removable, transparent cover in upper half of bearing bracket.

GREATER PROTECTION is provided as it is truly a weatherproof motor which meets or exceeds the standard dripproof specification for keeping moisture and dirt away from the electrical parts.

BETTER ACCESSIBILITY—bearing sleeves may be removed without disturbing bearing brackets or overhung exciter.

RIGID BRACKET BEARING CONSTRUCTION Brackets, cut from heavy steel plate, are split horizontally and upper half is removable for easy maintenance.

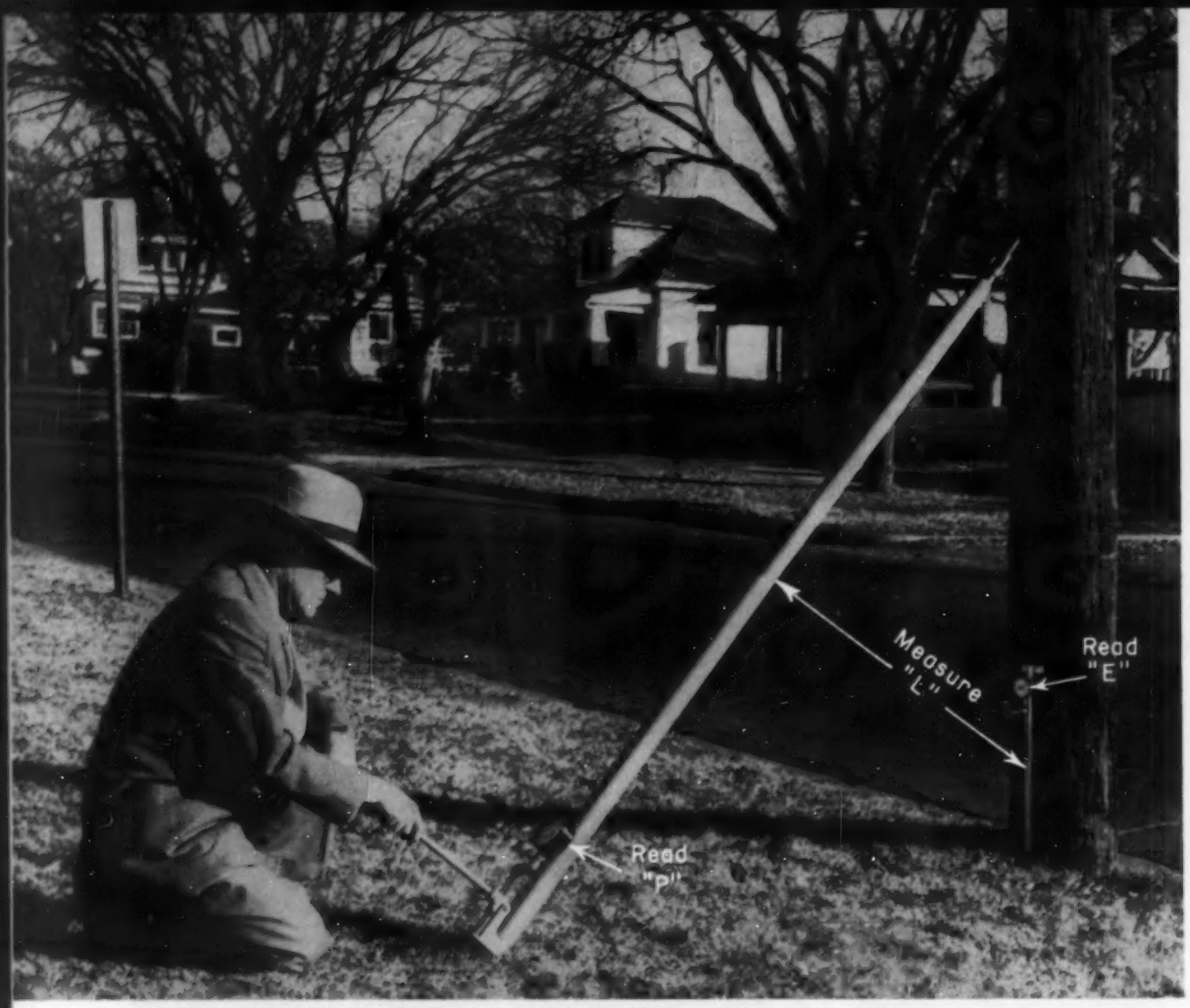
IMPROVED VENTILATION with louvered openings two on each side, for cool entering air discharged out bottom of motor, between feet at both ends.

• It's another step forward for Elliott Synchronous Motors. Note the new rectangular frame and bracket bearing construction. You can see at a glance how much has been done to improve appearance, strength, and operating performance and to simplify handling and maintenance. It's one more example of Elliott Synchronous Motor leadership. Contact your local Elliott Field Engineer for details or write the Elliott Company, Ridgway Division, Ridgway, Pa.

ELLIOTT Company

RS-6

TURBINE-GENERATORS TURBINES MOTORS GENERATORS DEAERATING HEATERS EJECTORS CONDENSERS COMPRESSORS TURBOCHARGERS TUBE CLEANERS STRAINERS



STANDING POLES are tested by applying stress with pike pole and hydraulic jack equipped with gauge for indicating the amount of stress. Extensometer measures fiber elongation. Method allows for internal and external deterioration

New Pole Test Abets Longer Use

Method developed at Oklahoma Gas & Electric Co provides more accurate data than prodding, sounding, or boring. Tester needs no special skill

BRYCE BRADY, Chief Administrative Engineer, Oklahoma Gas & Electric Co, Oklahoma City, Okla.

Strength remaining in standing poles can be determined today by a simple method believed more accurate than prodding, sounding, or boring. Accurate information on standing pole strength permits full use of pole life and replacement before failure. The new method allows for internal and external deterioration.

The tester needs no special skill or experience, and the method is applicable to all single poles supporting longitudinal wires and cables. An extensometer with indicating dial gauge is attached to two nails driven into the side of the pole. A small hydraulic jack with attached pressure gauge and a short pike pole produce a transverse force against the pole. Elongation of surface wood fibers is measured, and strength of the pole at the ground line is calculated in lb-ft of bending moment required to break it. The formula used is:

$$\text{Pole Strength} = \frac{KPL}{E}$$

where P and E are dial gauge readings of pressure and elongation, L a length measurement (shortest distance from pole surface at center of extensometer to axis of pike in inches), and K a constant taken from tables developed by the author with the cooperation of Oklahoma Gas & Elec-

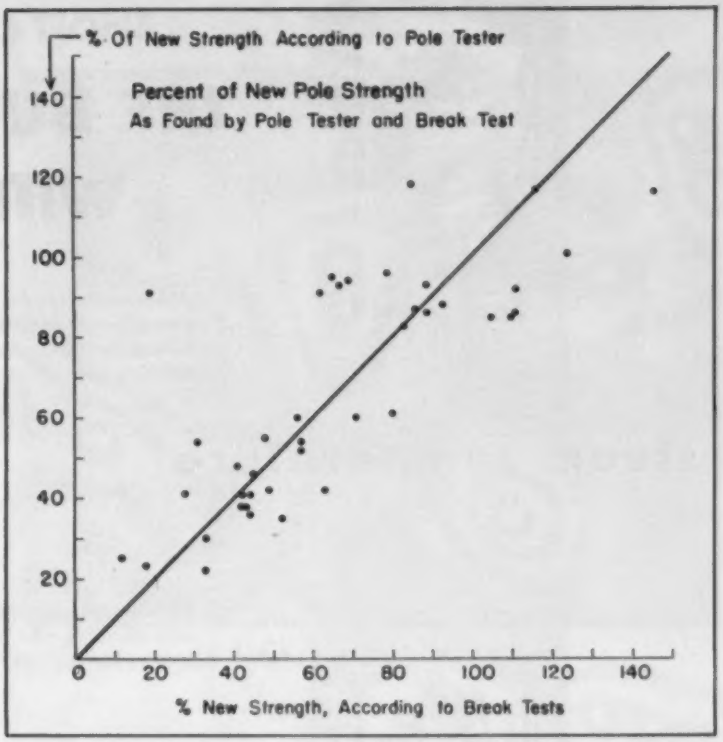
tric Co. The method allows automatically for detecting internal or external deterioration at the ground line. No probing or increment boring is required. The remaining groundline strength of an old pole is expressed in lb-ft of bending moment required to break it or as a percentage of strength when it was new.

One man can operate the test equipment which can fit in a passenger car trunk. Stress applied is always less than 10% of pole strength regardless of deterioration; so no harm is caused. Tests to date indicate that this method can test transverse strength of single poles supporting practically any combination of longitudinal conductors and cables, provided the pole is not supported transversely. Such support from service drops and slack spans increases the calculated strength of the pole above its true value.

Tests Work Under Varied Conditions . . . Tests have been made on southern pine and western red cedar and larch poles of various ages and states of deterioration. They have been made at all seasons, under various moisture conditions, and with various lengths of pike poles and different designs and lengths of extensometers. All poles were supporting longitudinal electric and/or communication wires and/or cables.

Destructive Tests Check Accuracy . . . In order that the accuracy of the new method might be investigated and "K" factors ascertained, Oklahoma Gas & Electric Co made tests to destruction on a number of southern pine and western red cedar poles. These were being removed from service for various reasons. Some of the poles were deteriorated; so the tests included hollow and otherwise defective poles. Others were inadequate in height; so some sound poles were included. The poles were distributed in the Oklahoma City, Southern, and Western Divisions; so various types of soil were represented.

The poles, previously tested with "pole tester," were left standing in their original earth settings. After all conductors had been transferred to new poles, they were broken with winch line and dynamometer. The remaining strength of each pole at the ground line was calculated by multiplying the winch line pull in pounds times the lever arm from pole attachment to ground line, with proper correction for the angle of pull. Nearly all deteriorated and most of the sound poles broke at or near the ground line.



TEST RESULTS which were obtained with the new pole tester are compared graphically with the data of destructive tests in percentages of new-pole strength

Because of space limitations and traffic along roads, it was necessary to break most of the poles with the winch line in the longitudinal direction. The "pole tester" had measured the strength in the transverse direction with respect to the pole line. This introduced some errors which may have been quite appreciable in the case of deteriorated poles.

The chart shows the degree of agreement between non-destructive strength measurements made with the "pole tester" and destructive strength measurements made with line and dynamometer.

In order that the tests with "pole tester" might be as representative as possible of actual field testing conditions, most field tests were made by groundmen lacking technical skill. Each groundman was shown how to use the "pole tester" equipment and made all tests by himself without supervision. The tests were not rechecked prior to the destructive tests.

K Factors for Use in Formula

Moisture of Soil Adjacent to Pole	Value of K where using extensometer length of 20 in. recommended for 40 ft. and shorter poles		Value of K where using extensometer length of 40 in. recommended for 45 ft. and taller poles	
	Old Pole	*New Pole*	*Old Pole*	*New Pole*
Wet	4.3	5.4	8.6	10.8
Damp	3.9	4.9	7.8	9.8
Dry	3.5	4.4	7.0	8.8
Very Dry	3.1	4.0	6.2	8.0

NOTE: For simplicity when testing for deterioration, all poles are considered as old. When testing accuracy of method, poles testing 80% or more of code strength are considered new.

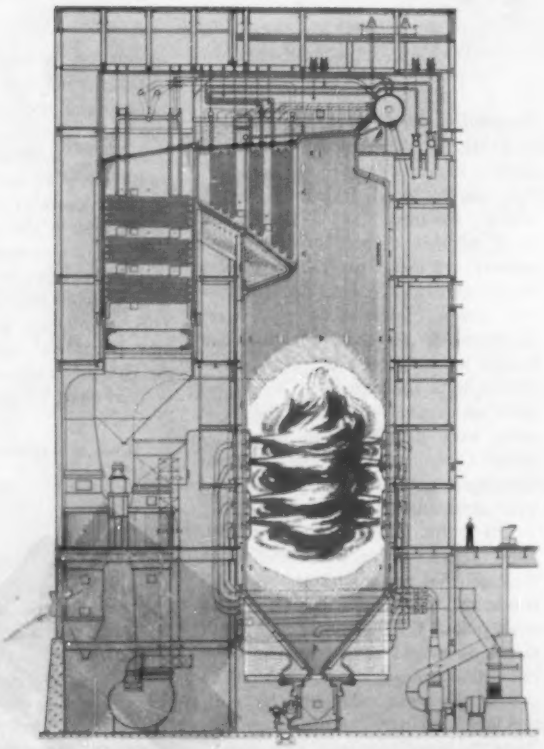
THE BURNER WITH A BRAIN

Automatically the C-E Vertically-Adjustable, Tangential Burner nozzles tilt downward. More furnace wall surface becomes effective. Gas temperature to superheater is lowered. *Steam temperature comes down.*

Conversely, if steam temperature drops below that most efficient for the turbine, burner nozzles tilt upward, sending hotter gases to the superheater—*automatically.*

RESULT—less need for desuperheating . . . minimum use of spray water . . . less chance of fouling turbine blades. Turbine availability is higher . . . efficiency is maintained.

Modern, high-pressure, high-temperature power generating units need the highest quality steam possible. That's exactly what they get with C-E Tangentially-fired Boilers.



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BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

With this kit . . .

to demonstrate latest safety practices . . .

21 Co-ops Reduce Accident Rate

A safety kit is used by 21 rural electric cooperatives in the Pacific Northwest as a major means of promoting safety. The kit has been a contributing factor in the low accident severity rate (0.54) among these systems.

Response has been so favorable that a group of Oregon, Washington, and Idaho rural co-ops are considering pooling their funds and hiring a full-time safety man to travel from system to system giving safety and job training instruction.

The safety program, centered around the kit, was created by Robert B. Smith, director of public relations, Inland Power & Light Co, Spokane, Wash. Each of the 21 co-ops associated with Inland receives the kit three times a year. Safety meetings are held when it arrives. The kit is designed to provide ideas and suggestions for safety in the small co-ops, none of which is large enough to support a full-time safety-man.

The kit, a wooden partitioned case, holds a slide projector, film and commentary, posters, handbooks, copies of recent safety and utility magazines, and a motion picture film. Projector for this film must be secured by the local system.

Smith also publishes a monthly safety bulletin containing tips, suggestions, and ideas for monthly safety meetings. For example, it shows the correct method of lifting a heavy object, advises foremen and supervisors to "set the correct example" in safety, and suggests the co-op crews discuss public relations as a safety factor and creator of good will.

Use of photos of completed work to show proper methods is suggested, along with the idea of staging a pole-top resuscitation contest among crew members. Occasionally the bulletin describes an accident and includes answers on specific treatment for the victim by a registered nurse.

While the decrease in accidents is not due entirely to the program, the kit and the bulletin are major factors in keeping workers and supervisors safety conscious. The group reports a low accident severity rate of 0.54. One system, Public Utility District No. 1 of Kittitas County, Ellensburg, Wash., won last year's competition with a no-lost time accident record since February 1951 during which period a total of 17,055 man-hours were worked. Fifteen of the 21 co-ops report 260 employees worked 516,330 man-hours with only 33 lost-time accidents.

Industrial Relations Briefs

The Ninth Annual Round Table Conference, sponsored by the Industrial Relations committee of the Edison Electric Institute, will stress as an over all theme "Reaping the Profits of Good Personnel Administration." The conference will be held at the Drake Hotel, Chicago, Ill., on Sept. 19-21. For reservations to the conference, write Edward S. Evans, secretary, 420 Lexington Ave., N. Y. 17 . . . **National Society of Professional Engineers** has said that employment problems between management and engineers should be solved by cooperation rather than by unionizing engineers. Society stated in a report that "professionalism and unionism are incompatible concepts."

Super power transformers pace utility expansion

New Era in Power Transmission

THIS 230,000-volt, 150,000-kva power transformer was built by Allis-Chalmers for Duke Power, to be installed at Riverbend steam station near Mt. Holly, North Carolina. It is believed to be the highest kva transformer ever put into service in the 230,000-volt class.

Records are being broken almost monthly as larger and larger power transformers are shipped by Allis-Chalmers to utility installations all over the country. For example, the highest voltage transformers ever ordered in the United States are now being built by Allis-Chalmers. These will be 345,000-volt, 200,000-kva single-phase units that will form the largest bank ever built — a total of 600,000 kva. They will be shipped at the end of this year.

Allis-Chalmers is becoming the overwhelming choice to help utilities break the barriers of high voltage transmission with larger and larger transformers. Here are some of the reasons why:

Allis-Chalmers pioneered the development of corona-free design. Result: Possibility of insulation damage that previously made such large transformers difficult to design is completely eliminated. Buyers are assured maximum transformer life with no danger that corona will cause insulation breakdown.

Allis-Chalmers last year successfully produced the highest voltage commercial-type transformer ever built. The 600,000-volt unit gives utilities a proved means for lifting voltage horizons even farther. It produced data which show the practicality of designs for power transformers for 880,000-volt transmission.

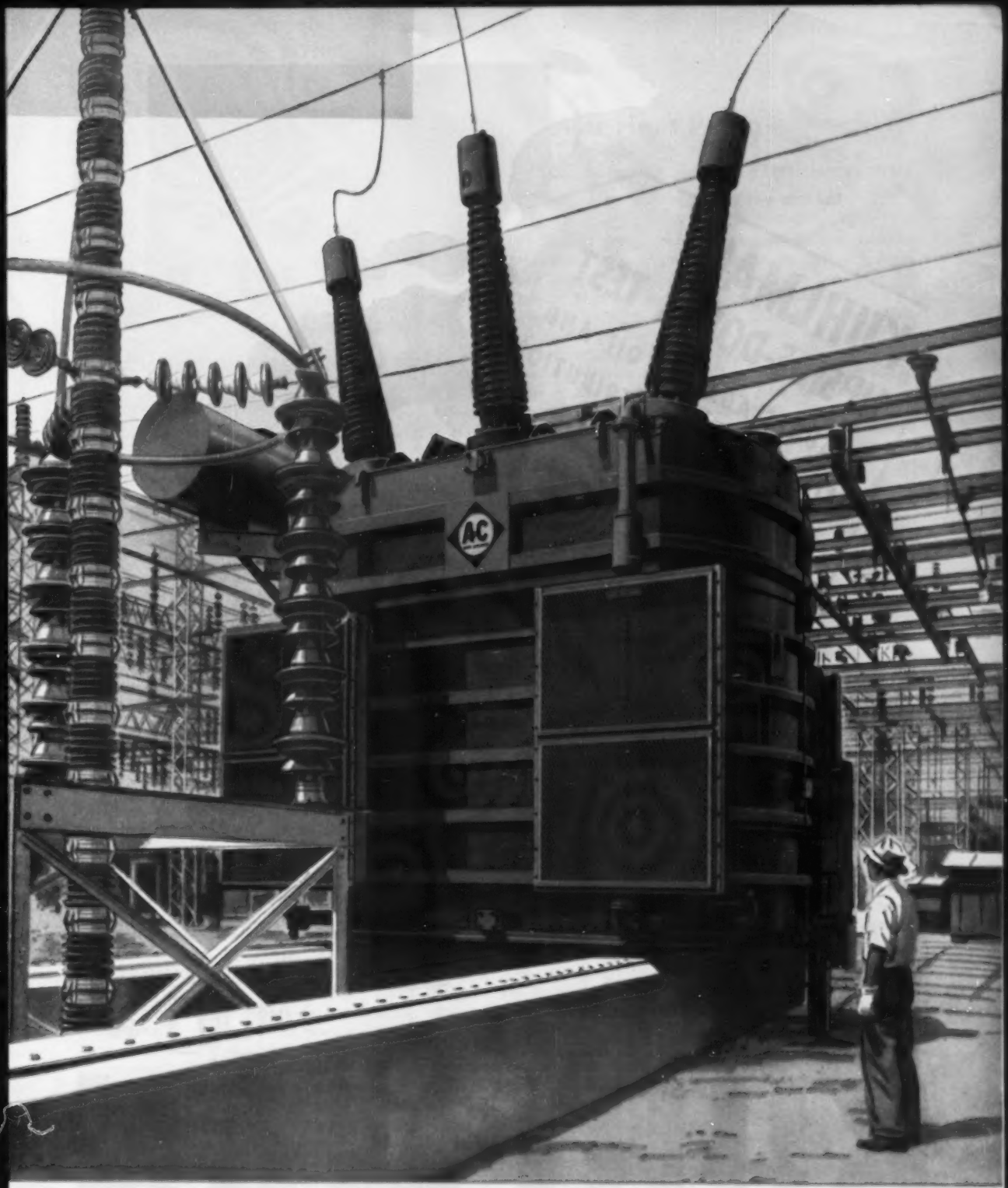
Allis-Chalmers successfully adapted welding techniques to make possible the use of heavy plate aluminum in transformer core and coil construction. As a result, transformers are lighter in weight, can be built in larger sizes, and can be more easily shipped and installed.

An Allis-Chalmers representative will be glad to discuss transformer developments with you at your convenience. Call the nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wis.

A-4573

A-C ALLIS-CHALMERS

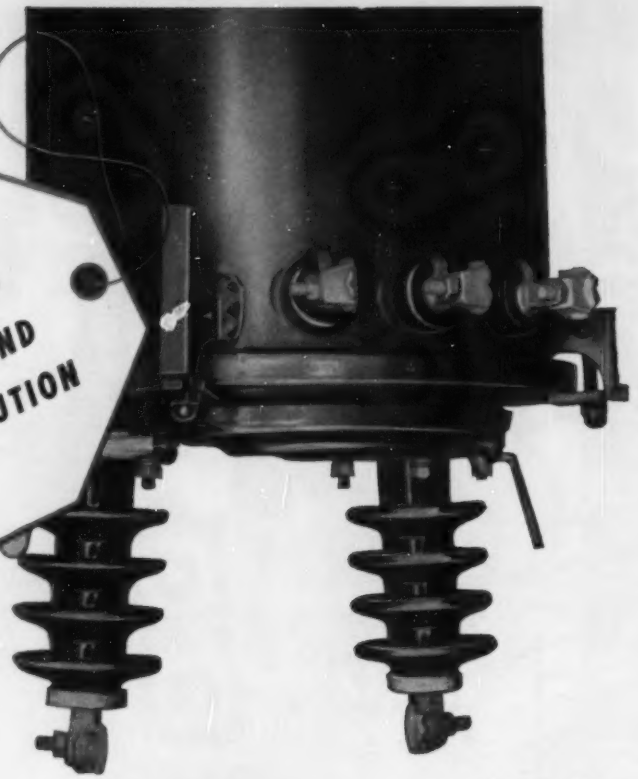
ALLIS-



CHALMERS

KUHLMAN UPSIDE-DOWN TEST

INSURES AGAINST OIL AND AIR LEAKS OF DISTRIBUTION TRANSFORMERS



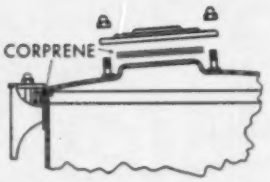
In addition to the thorough and exacting tests required by NEMA Standards*, all KUHLMAN Distribution Transformers up to 50 KVA receive a special upside down test, followed by a pressure test for air-tight, leak-free operation. First, the transformer is rotated 360° in a vertical plane to make sure there are absolutely no oil leaks, particularly in the vulnerable spots above the normal oil level line, where leaks are almost impossible to detect with the transformer in an upright position. Then a pressure test under simulated operating conditions prior to shipment provides a final check against oil and air leaks. Transformers above 50 KVA are pressure tested and checked for oil and air leaks with an electronic leak detector. KUHLMAN also spot tests all distribution transformers for impulse, audible noise, radio noise, and power factor in addition to NEMA requirements.*

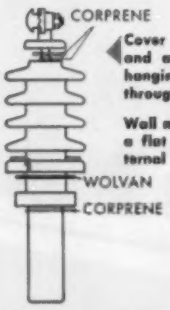
*KUHLMAN Distribution Transformers are tested as required by NEMA Standards for:

- winding resistance
- ratio
- polarity
- phase relation
- no load loss
- exciting current
- impedance
- load loss
- temperature
- applied potential and induced potential

Here is why KUHLMAN Distribution Transformers are air-tight, leak-free and moistureproof:

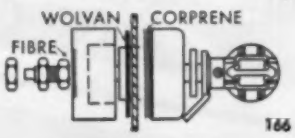
Cover and hand hole cover corprene gaskets are under constant uniform pressure insuring a permanent air-tight seal.





Cover mounted bushing gaskets have a flat seat and are held in place and protected by overhanging flanges of the bushings. Compression is through external clamps.

Wall mounted bushing gaskets are also seated on a flat surface and compressed by tightening internal nuts on bushings.



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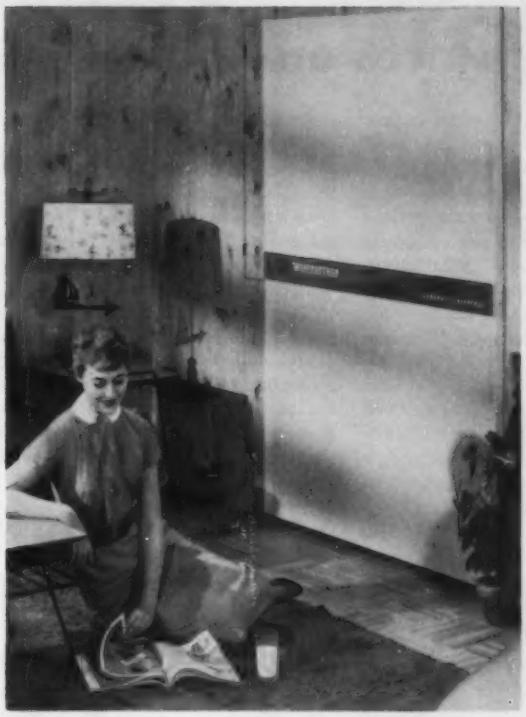
KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • CRYSTAL SPRINGS, MISSISSIPPI • SALINAS, CALIFORNIA



BOTH SIZES of new air-to-air, packaged units are housed in same-size cabinets, can be installed in living areas

Smaller Heat Pump:

GE hopes its improved efficiency, more compact size will broaden the market

New heat pumps, more compact in size and featuring replaceable hermetic motor compressors said to improve their heating-cooling ratio were unveiled last week by General Electric Co's Weathertron Department.

Both features, says GE, are in line with its announced intention to get the heat pump into the mass market as quickly as possible. It was unable to give direct price comparisons with the old models. But it claimed that in terms of Btu-hr capacity, installed price reductions on the new units range between 10 and 25%. Officials, in fact, declared the new price levels would make the system competitive with systems using fuel-fired heating and conventional air conditioning.

Capacity of the new 44C (three-ton) model is claimed to be 60% greater and the 66C (five-ton) 36% more than the old models, making them applicable to larger installations. In general, says GE, the 44C will heat and cool a house of six to eight rooms while the 66C will handle one of seven to nine rooms.

Key factor in the improved heating and cooling relationship, it says, is the new modulated motor compressor. Hermetically sealed, it is replaceable and carries a five-year warranty. Both the three and five-ton units are housed in the same-size cabinet (28 x 48 x 71 in.) which occupies 9.8 sq ft.

More Farm Research Urged by RMA Group

Expansion of research on use of new machines and techniques for handling, curing, drying and storing farm products on the farm has been recommended by a federal research agency.

The Production Economics Research Advisory Committee, at its annual meeting recently, urged this action and others in an over-all step up of production adjustment research on farms faced with reduced market outlets. Committee members said there is a need for studies in all of the "type-of-farming" areas where wheat, cotton, or butterfat is a major product.

Among other phases of farming which could bear more investigation said the committee were: Profitable use of feed and forage by livestock; economics of irrigation and of irrigation systems and practices; new types of credit arrangements to facilitate needed farm adjustments.

The committee, composed of farmers, educators and agricultural equipment manufacturers, was established under authority of the Research and Marketing Act of 1946. Dr Carleton P. Barnes of the Agricultural Research Service is executive secretary.

Wages Lost Without AC

Equivalent of $108 in wages for each employee is lost during the year in the average plant without air conditioning. This is the report of a survey made by Engineers Co, Inc, Newark, N. J., of 75 manufacturing plants in the New York City area.

Survey showed that workers in plants without air conditioning slowed up or stopped working completely on about the 100 hottest or most humid days each year. In plants with air conditioning, on the other hand, employees were more prompt in reporting for work, took shorter lunch hours, stayed until quitting time and worked more efficiently.

Two More Get Wire Plan

Wire on time plans have been taken on by two more utilities—Iowa Power & Light Co and Pennsylvania Power & Light Co.

PP&L, which has been financing wiring costs for electric ranges and water heaters since last fall, will extend the plan to include driers and three-wire service facilities. Plan, now being announced, will continue to April 30. Iowa P&L's program, already underway, carries charge of 5¼%, the same as on Federal Housing Administration insured loans. Both companies allow residential customers up to three years to pay on their service bills.

Fixed Light Drive Set

Installed home lighting fixtures will get a $50,000 promotional push next October during National Lighting Fixture Month. American Home Lighting Institute will sponsor drive.

Westinghouse to Adjust Prices on Apparatus

A new price policy involves a new "formula type of price escalation" to adjust prices on certain heavy electrical apparatus requiring long periods to manufacture. This new policy, announced by Westinghouse Electric Corp of Pittsburgh, Pa., adjusts prices according to a formula which takes into account changes in the monthly costs of material and labor as reported by the United States Bureau of Labor Statistics.

The new formula, according to F. D. Weatherholt, sales manager for apparatus products, replaces a former policy which adjusted the original order price to the piece in effect at time of shipment with a stated maximum percentage adjustment.

"This new price policy has been adopted in line with recommendations from various Westinghouse customers and customer groups," Weatherholt said. "One such group was the Public Utility Buyers Group of the National Association of Purchasing Agents who met in Houston last month."

Apparatus . . . Weatherholt explained that the new price policy covers heavy rotating equipment such as large turbine generators, waterwheel generators and synchronous condensers, also large power transformers and large oil circuit breakers. The policy became effective midnight March 15 and customers may have the option of applying the new "price adjustment clause" on orders and contracts which date back to Dec. 1, 1954.

The formula adjusts the contract price in accordance with changes in a monthly labor adjustment index and a monthly material adjustment index. For purposes of adjustment, the proportion of the contract price representing materials is figured at 35% and the portion representing labor 55%.

Alcoa to Add Potlines At Two Texas Plants

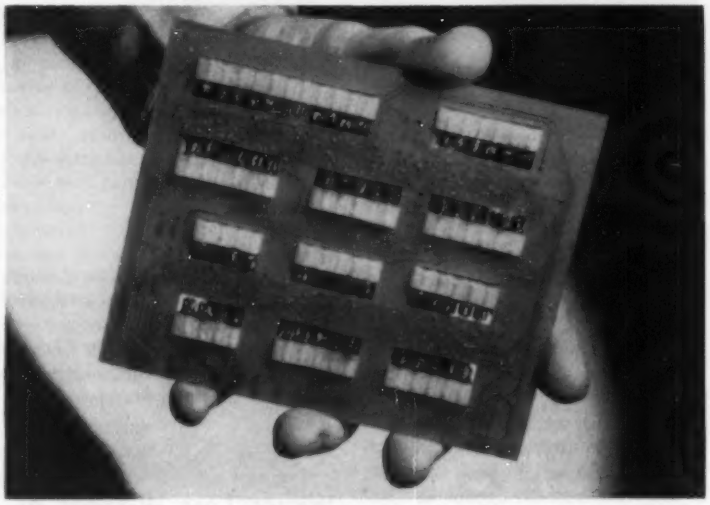
Aluminum Company of America will increase its aluminum smelting capacity by approximately 65,000 tons annually at its two Texas plants.

Construction has been started to add two new smelting potlines at the Rockdale Works and one additional potline at Point Comfort, together with necessary related facilities at both locations. The Rockdale capacity is expected to be increased by 45,000 tons of primary aluminum annually, and that of Point Comfort by 20,000 tons. Present capacity of each plant is 90,000 tons annually.

John D. Harper, manager of Alcoa's Rockdale Works, indicated that the new facilities would add more than 300 new jobs at that location. B. H. Sloane, manager of the Point Comfort Works, said the expansion would increase the number of employees there by 150.

Total cost of the new facilities at the two Texas sites will be in excess of $35 million. The new units at both locations are expected to be in production some time during the second quarter of 1956, according to an announcement.

The new facilities, according to the statement, are being added for the dual purpose of increasing the nation's industrial base for defense and to provide additional capacity for expanding civilian markets.



"DIGITAL CARD," a unit of TRANSAC, has direct-coupled circuitry, with 62 transistors and 18 resistors (on reverse side), and controls circuits.

Philco Develops Transistor Circuitry

A new concept of linking transistors in a miniature "electronic brain", called the transistor automatic computer (or TRANSAC), has been developed by Philco Corp of Philadelphia, according to Leslie J. Woods, Philco vice president.

Known as the Philco direct-coupled transistor circuit (DCTC), the invention presages mass production of transistorized computers capable of calculations at phenomenal speeds, Wood stated. He pointed out that the high rate of speed achieved is made possible by the use of the "surface-barrier" transistor. Direct-coupled circuitry is designed for use in the arithmetic section of a computer.

"We can accomplish the same electronic objective," Wood said, "with a great saving in the number of parts, the number of wires and soldered connections, at approximately 0.001 of

(*Continued on page 59*)

NOW...Chance Pike Poles are laminated!

No other Pikes can compare in . . . Quality . . . Durability . . . Safety

for greater uniformity ...greater rigidity

Made just like a Hot Stick!

Now . . . Chance Pike Poles are made the same way famed Chance Hot Sticks are made . . . by lamination . . . by bonding together carefully selected Douglas fir boards.

Laminated pike poles have many advantages over the old, single board pike poles. They're more rigid. They're more uniform . . . every Chance *laminated* Pike Pole has the same high quality built into it. (Quality is hard to control in single board poles.) Best of all, a *laminated* pike pole is safer. It resists dangerous splitting because the grain of the laminated pieces runs in different directions . . . each board reinforces the other.

STANDARD PIKE

SAFETY PIKE

Point can be reversed, as shown in circle, for safety in handling and transporting between jobs. When point becomes badly worn, a new reversible point is all that is needed—the pole needn't be replaced.

MAPLAC

plastic protected

Chance *laminated* Pike Poles are available with a tough, plastic coating, called "Maplac," that greatly increases their service life and adds to their safety. Splintering of the wood is eliminated. Lost-time hand injuries caused by splinters are avoided.

IT PAYS TO BUY HIGH QUALITY IN A PIKE POLE

Only on a *Chance* Pike Pole will you find the steel reinforced butt which protects the end of the pike. And only *Chance* Pike Poles are available with Maplac protection.

Write for the full story today.

You know it's RIGHT when you specify CHANCE

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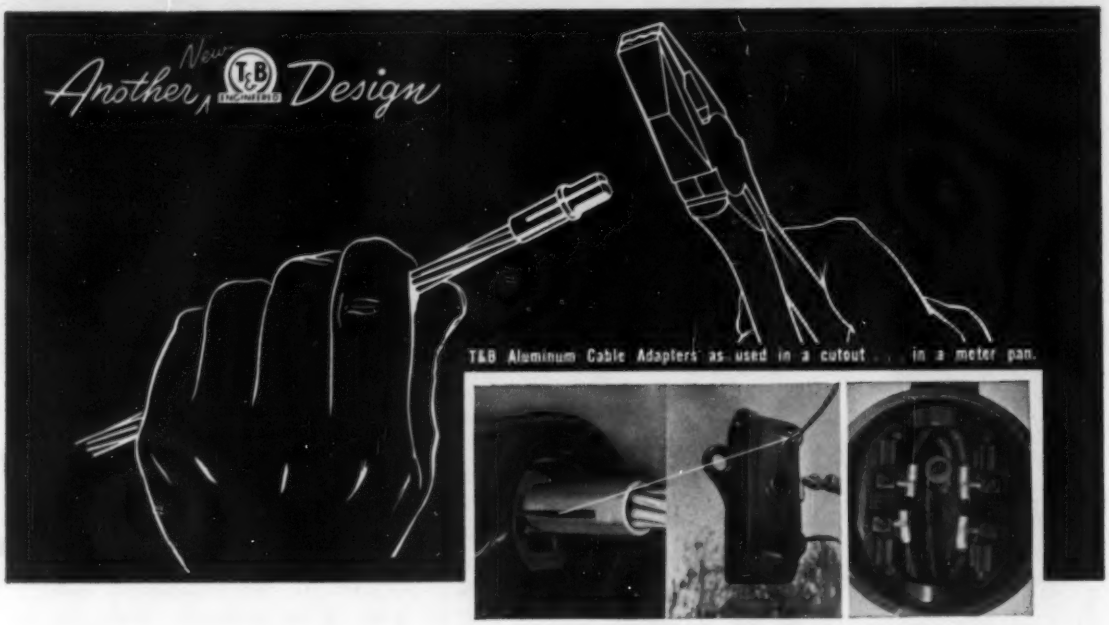
CT99-1 **CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA**

ABC INDUSTRIES

IF YOU'RE WIRING WITH ALUMINUM . . .

Utility Engineers are now installing aluminum cable in many places where only copper had been suitable. Equipment such as transformers, capacitors, cutouts, switches, and meter pans, having terminals designed for copper conductors, are now being wired to aluminum and A.C.S.R. with little or no difficulty.

How? T&B's new Aluminum Cable Adapters. They're made of heavily-tinned copper alloy; take up little more space than the cable; install in a jiffy. A lineman or electrician merely taps one onto the end of the conductor, then clamps the adapter as though it were copper conductor. "Straight" and "flag" types are available. The flag type is best for connections at right angles to cable outlets.



One of the outstanding features of these new adapters is the serrated bore. As the adapter is tapped onto the cable, the serrations bite through the aluminum oxide coating. The high-conductivity connection thus formed is maintained, despite weather and moisture, by an oxide inhibitor precoated in the bore. The clamp end is slotted and spring-like to maintain pressure during thermal expansion and contraction.

These versatile Cable Adapters are opening up many new applications for aluminum cable. Sizes for cable up to #2 Str. at present. If you're wiring with aluminum, you might possibly have a unique application. If so, let us know about it. We'll be glad to send you a free sample of the adapter and descriptive literature. Write to The Thomas & Betts Co. today.

Note how the bore serrations have scraped through the oxide coating on the cable end.

LOOK FOR THIS SIGN — T&B ENGINEERED — AUTHORIZED DISTRIBUTION

IT'S THE MARK OF AN AUTHORIZED T & B DISTRIBUTOR

The complete line of T & B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs. T-415

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MANUFACTURERS OF FINE ELECTRICAL FITTINGS SINCE 1898

Philco Develops

(*Continued from page 56*)

the power requirements."

In packaging a computer using the Philco direct-coupled circuitry all elements required for addition, subtraction, multiplication, and division, as well as common control circuits, are combined on a single replacable unit —a printed wiring card—having on it only transistors and resistors. See illustration. No other electronic components are required in the arithmetic section of the computer. As the precision of the computer is increased, only "cards" need be added.

The control section of the computer uses "cards" similar in appearance to the "digit cards", Wood said. However, a relatively few miniature condensers along with the "surface-barrier" transistors are required.

Specifications follow for a computor arithmetic section. A total of 20 cards are inserted in a 5.5-in. cube. The logic of the machine is parallel asynchronous. Precision is 19 binary digits plus algebraic sign. On the cards are mounted 1,242 transistors and 322 resistors. Speed is 2.4 microseconds for addition and subtraction, 48 microseconds for multiplication or divide, and 0.4 microseconds for shift. Power supply is 5.75 w at 3 v.

The 20-card cube might be considered equivalent to three 6-ft relay racks with tubes. These data give an idea of the savings in size, weight, and power requirement.

Copper Production Down

Primary copper production in United States according to the Copper Institute, New York, was 86,115 tons in February, a decrease of 816 tons from 86,931 tons in January. Refined copper production was 123,162 tons in February, a decrease of about 680 tons from January. Deliveries to fabricators, including tonnages delivered from Government stocks as well as imports of foreign copper for account of Copper Institute members and others, amounted to 108,503 tons in February, down from 113,949 tons the previous month, and 121,907 tons in December, 1954. Refined stock was 44,579 tons in February, down about 1,400 tons from January and 2,530 tons from December, 1954.

Sangamo Capacitor Plant Has Resumed Operations

Sangamo Electric Co resumed operations at its Capacitor Division Ordill plant near Marion, Ill., on March 17 after the employees had been on strike since Feb. 10, according to a company spokesman.

Power capacitor operation has been delayed but will be in production again by April 11. Capacitor deliveries are expected to begin by the end of May.

Employees have returned to work on company terms with no wage inducement granted, the spokesman stated.

Southern Electrical Makes 'Compacted' Service Drops

A compressed-conductor type of aluminum service drop cable has been developed by the Southern Electrical Corp of Chattanooga, Tenn., a manufacturer of aluminum and copper transmission and distribution cables.

The new product is designed primarily as triplex self-supporting service drop cable and is marketed under the registered name "Compresto." The name denotes the compressed and compacted cross-sectional area of the aluminum conductor.

Following salient advantages are claimed:

Through the use of a special drawing technique, a flexible conductor of a smaller diameter is attained yet maintaining full aluminum cross-sectional area. This eliminates voids between strands as in an ordinary stranded conductor. Neoprene is the insulation. The covered-conductor weight is reduced by about 10% while maintaining the same insulated wall thickness. Having a greater contact surface area for available connectors, the proper connection is made without causing loss of physical properties through deformation of conductors.

In the heavy loading areas of Canada this smooth-body design in bare conductors has proven advantageous for many years, the manufacturer advises.

Aluminum Production

Primary aluminum production in the United States, as reported by the Aluminum Association, was 116,236 tons in February, down from 128,203 tons in January, but up from 110,483 tons for February, 1954. Total production was 244,439 tons for 1955 through February, compared to 226,729 tons for the same period in 1954. The all-time record month for production was January, 1955.

Two New Aluminum Plants For Anaconda Ready Soon

Anaconda Wire & Cable Co reports progress in its aluminum expansion. The company will have its own major source of primary aluminum and its rod material in a few months.

The new aluminum reduction plant at Columbia Falls, Mont., is designed for a production capacity of 120 million pounds of primary aluminum annually. Operation is scheduled to begin July 1. An aluminum rod rolling mill at Great Falls, Mont. will have wire drawing and stranding equipment (EW, Oct. 25, 1954, p 59). It is expected to be in production by early summer. This latter mill will bring to a total five aluminum wire and cable mills. Other four mills are in Orange, Calif.; Sycamore, Ill.; Marion, Ind.; and Hastings-on-Hudson, N. Y.

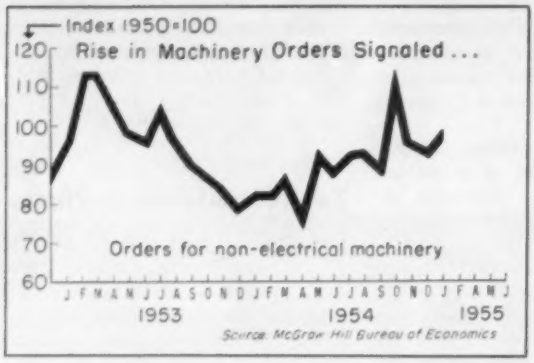
MANUFACTURING BRIEFS

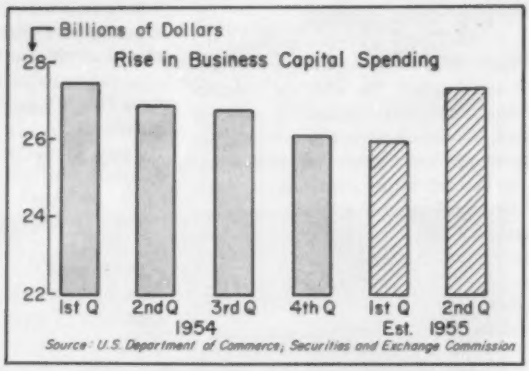
Roller-Smith Corp of Bethlehem, Pa., through its Instrument Division has announced the appointment of Quality Electric Co, 2212 South Hill St, Los Angeles, Calif, as its West Coast repair station.

New ASA Publication. To be issued in April is the publication "American Standard Requirements for Instrument Transformers," ASA-C57.13-1954. Price $2.50. It is an editorial consolidation and the first in a series of standards to be revamped (of the existing C57 standards) so that each product line would be covered in a separate section.

Sylvania Electric Products Inc has started operations at a new address—4700 Parkside Avenue, Philadelphia, Pa. In this new 58,000-sq ft building are consolidated the sales, service and warehouse facilities.

ELECTRICAL BUSINESS OUTLOOK





Capital Outlays Improve '55 Outlook

The charts above show a new bright note in the business outlook. It's a welcome note to anyone who has been worrying about business in the second half of 1955.

Business capital spending is due to turn up, according to the regular Securities and Exchange Commission-Department of Commerce survey. The SEC-Commerce figures confirm a trend that showed up last fall in the index of new orders for non-electrical machinery. (EBO, September 27, 1954).

The machinery orders index is compiled by the McGraw-Hill Department of Economics. It started to recover in mid-1954 after a long, slow decline that followed the rush of machinery orders after Korea was attacked. And it's shown a gradual rising trend ever since.

Capital Spending Good For Business . . . An upturn in business capital spending would be a strong force favoring continued prosperity after the middle of the year. Spending for new plants and equipment is big—$27.8 billion last year. And it's famous as a volatile element in the economy. Last year, business spending for new plants and equipment dropped by more than 5%, and it kept on going down after the rest of the economy turned up. It's good to have it headed back in the right direction.

For the year as a whole, the SEC-Commerce figures do not show much gain—only 1%. And most industries may actually spend less in 1955 than in 1954. But the important point is that the first quarter is expected to be the bottom for the year. Capital spending by most industries will be on the rise from now on.

The big increase in capital spending this year is for commercial properties—stores, communications and so on. They plan to invest 7% more than in 1954. Public utilities plan to invest about 4% more than they did last year.

All other major industry classes expect lower levels of investment this year. Manufacturing companies plan to invest 3% less than in 1954. But, as noted above, the trend in these industries will be up after the first quarter low. And some industries most important in electric power consumption actually plan to invest more this year. These include iron and steel, nonferrous metals, and the petroleum industry.

More capital spending means more than just a boost for the economy, of course. Eventually, it means more consumption of electric power, too. New plants and equipment generally use more electric power than the ones they replace.

The prospective rise in capital spending is especially welcome this year. Business forecasters have been even more uncertain than usual about prospects for the second half of this year. They all see a boom through June or July. But the crystal ball has been pretty cloudy about what happens after that.

Autos, Housing Mar Outlook . . . Doubt about the second half is caused by the auto and housing booms—two of the key elements in present prosperity. Auto production seems bound to fall sharply this summer, after record production in the first six months; there's bound to be a lull even if sales match the most extremely optimistic predictions.

A lull in autos might mean a lull in steel, rubber, glass—all the industries that depend heavily on the monster auto industry to take much of their production.

And there is some belief that housing will slow down, too, because of materials shortages and perhaps tighter mortgage money. If autos and housing slow down together, we will need a push from some other part of the economy. A boom in non-housing construction, and the expected widespread wage increases will help in the second half. Business' plans for more new plants and equipment, added to these other forces, make the second half look pretty good.

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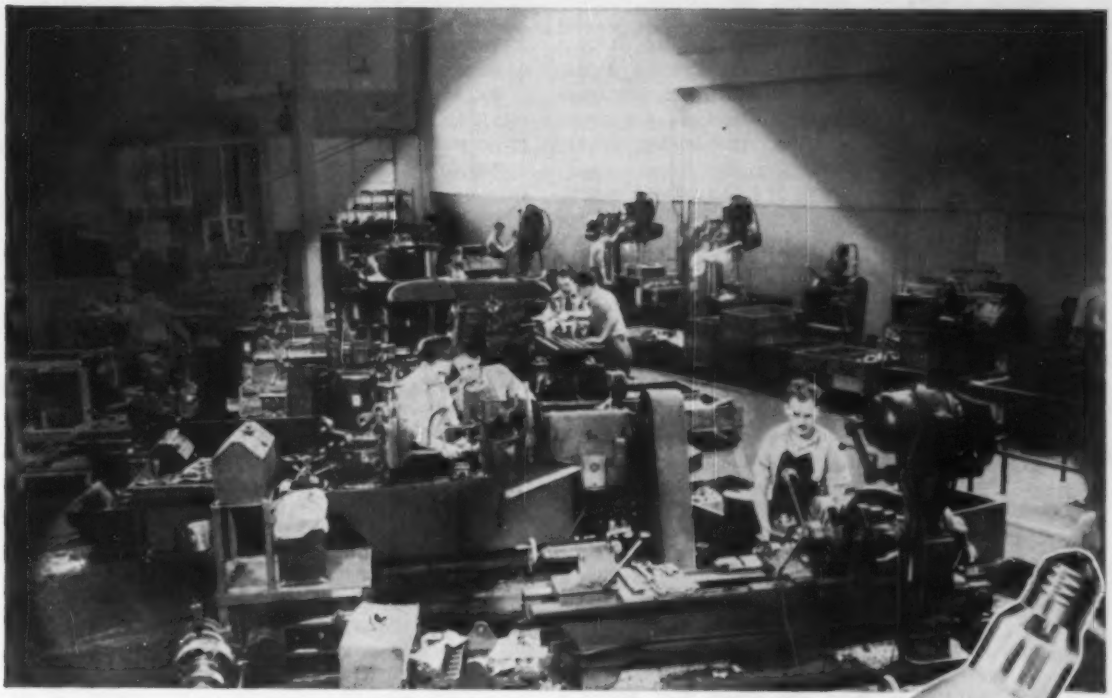
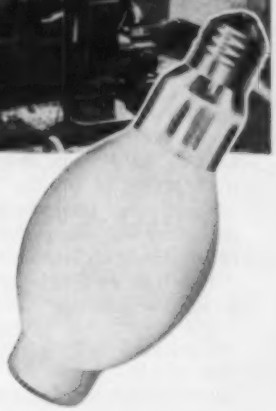


SYLVANIA J-H1 mercury-vapor lamp



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With this new lamp, you get more "golden white" light . . . without the color distortions you expect from a clear mercury lamp . . . 18,000 lumens of "golden white" light . . . in a lamp that lasts over two years in normal industrial use. That's more than twice the output of an incandescent lamp of equivalent wattage.

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Keep your eye on SYLVANIA

...fastest growing name in sight

Can You Cope with an H-Bomb Disaster?

The answer now is "no." But the federal government is assembling data which should be valuable to electric utilities in drawing up civil defense plans

Electric utilities are probably much better prepared than other industries to initiate comprehensive disaster plans such as would be needed in the wake of an H-bomb strike. Many already have extensive plans for digging out of such natural disasters as hurricanes, tornadoes, sleet storms, and fires. They participate in mutual aid for inter-utility cooperation in rehabilitating stricken systems.

But for the broader demands of a civil defense program the utilities lack leadership and technical information. A goodly share of both must come from the federal government. It alone has the authority and resources to provide a coordinated civil defense program. It alone has the facilities to provide the technical information on which to base civil defense plans.

Much Information Buried . . . A considerable amount of general civil defense information has already been gathered from atomic tests in the Pacific and in Nevada, but very little of it has been put in usable form. The widely touted "Operation Candor" for publicizing the data still hasn't gotten off the ground.

From what we have been able to learn, radiation hazards and magnitude of destruction are two factors that differentiate atomic warfare from the more normal and natural disasters faced by electric utilities. The Atomic Energy Commission and the Federal Civil Defense Administration hope to learn more about the play of these two factors on electric utility facilities during atomic tests on the Nevada desert next month (EW, March 7, p 77; March 21, p 106). They may be able to learn, for instance, what effect intense radiation has on insulating oils. They will also gather data on the destructive effects of an atomic explosion on distribution lines.

Just how soon this information will be available to utilities, nobody has yet said. Much information said to be of value is still buried in government security files. Recent hearings have spot-lighted disagreement between FCDA, AEC, and the Defense Department on the release of such information.

But while the federal government has done little in providing technical information needed to evolve a comprehensive disaster plan for utilities, it has at least made a start in providing more general information.

Some Immediate Help Is Available . . . The Business and Defense Services Administration under the Commerce Department is working with industry on civil defense planning. A pamphlet, "Job for Management," rounds up some of the general thinking on the subject. It is available from BDSA in Washington. Special handbooks on disaster and defense planning for some industries have been prepared by task forces from the industries working in cooperation with BDSA. The agency also offers counsel and assistance to individual firms.

Policy behind these efforts is to provide general information on broad management problems with regard to civil defense rather than provide tailor-made disaster plans for the individual company or system. That responsibility has been placed on the doorstep of the individual management because it alone has the authority to develop policies and plans to protect its personnel and plant.

Of course the urgency of this planning will vary with the military importance of a utility service area. If the area is a prime target for enemy attack, immediate protective and rehabilitation measures are needed. If the area is less strategically located, management may need to consider only minimum measures to cope with enemy-inflicted damage. However, even the systems remote from industrial centers and other targets will have to learn more about radiation hazards since these spread hundreds of miles.

TECHNICAL NOTES

Automatic load shedding poses ponderable problems. Difficulty is not the frequency relay nor its setting but how to select which loads to sacrifice during system disturbances.

Radioactive isotopes show promise for dust precipitation and in the fields of ventilation and air conditioning.

Switching surges exceeding arrester sparkover may be obtained on station buses of effectively grounded systems using line breakers that will not restrike more than once per phase during an interruption. Oscillatory duration may be 1,500 to 4,500 microsec.

Series-multiple switching of capacitors can stiffen "skinny" line voltage to start large motors.

Generator relay protection commonly embraces three functions: differential, loss of field, and field ground detection. Supplemental functions may be: Excessive negative-sequence current, out-of-step operation, anti-motoring, overvoltage, overspeed, vibration, bearing temperature, and fire.

Altimeters are now developed to measure altitudes as close as 2 ft. Former sensitivity was restricted to 10 to 20.

Boston Ed Gets Revised Order

Massachusetts DPU rules to strike out the provision which freezes surplus in regard to company's $18 million bond issue

In an order dated Jan. 10, 1955, the Massachusetts Department of Public Utilities has amended certain restrictions which it had imposed in an earlier order (July 9, 1954) permitting Boston Edison Co to issue $18 million of Series E bonds.

The DPU in its present order pointed out that with this new issue, this would be the amount by which the outstanding bonds would be in excess of the company's capital stock and premium and that ". . . we stated in our opinion that where the surplus account is used for the issuance of long term debt, it should be frozen in that amount."

The order said: "Company now requests us to reconsider this determination and to strike out from our order the provision freezing surplus.

"Prior to 1950, section 13 of chapter 164 of the General Laws provided that the petitioner, as an electric company, could issue bonds to an amount not exceeding its capital stock actually paid in, increased by all cash premiums paid. By chapter 237 of the Acts of 1950, this restriction was enlarged to include an amount equal to the surplus invested in plant. By chapter 85 of the Laws of 1953, the legislature struck out the words 'invested in plant' and left simply the words 'surplus', thus authorizing the company to issue bonds equal to its capital, premium and surplus.

"The company contends that the quoted restriction contained in our order will deprive it of substantially all the benefits of the 1953 amendment since it will not issue bonds to an amount in excess of its capital stock and premium if any restriction is to be placed on its surplus by reason thereof. . . ."

The DPU, in granting the company relief from this restriction, said in part, "The argument was advanced to us that this action of the Department was inconsistent with the intent of the legislature in enacting the 1953 amendment whereby, so it is said, the legislature intended that the debt ratio of an electric company should thereafter be computed on the basis of its total net worth without regard to whether the surplus was actually stated to be invested in plant or in any other way restricted.

"We cannot go so far as to concur with this suggestion in its entirety. We do not believe it was intended by this legislation to do more than enlarge the limits within which the Department might exercise its sound discretion. We believe there are and will be numerous situations where the Department should restrict the ability of the issuing company to use its surplus for payment of dividends where its long term securities aggregate more than its par plus premium," the order stated.

Company Soundly Managed

"However, we do not find upon reconsideration any reason which would compel us to exercise that discretion in this case. We believe Boston Edison Co to be soundly managed and financed and to be rendering adequate service at rates which are as low as its situation will permit. Although we still feel that a provision similar to that quoted should as a general rule be inserted in our orders in situations of this nature, we conclude that the Boston Edison Co should not presently so be hampered in its financing plans."

Oregon House Committee Tables Utility Bills

Bills that would have cost Oregon private and public utilities millions of dollars in taxes have been tabled by the House Taxation Committee while consideration of three others involving corporate taxes has been delayed until alternate proposals are introduced in the legislature.

Tabled were a bill of Rep Katherine Musa, The Dalles, which would have imposed a 6% gross earnings tax on all electric, gas, telephone, and other utility companies and a bill, introduced by the taxation committee, which would have removed the ad valorem tax exemption on rural electric cooperatives which now pay a 2% gross revenue tax.

Mrs Musa declared during a hearing prior to committee action that the utilities have not borne their share of the tax burden. She cited valuation or real property in her home bailiwick of Wasco County. She said public utility companies in 1951 had real property valued at $7,075,016 of the county's total $11,154,016. In 1955, she said, the total had risen to $13 million but the utilities' valuation figure was $6,079,000. However, another committee member, Rep Wayne R. Giesy, Monroe, reported the changed ratio reflected the equity between real property assessed by county commissioners and that assessed by the state tax commission.

Francis Hill, Portland attorney representing Pacific Power & Light Co, reported the tax proposal would have cost the company $1.8 million last year and have required higher rates. Waldemar Seton, vice president of Portland General Electric Co, said PGE paid taxes to all agencies last year in the amount of 24½¢ of each revenue dollar. Mrs Musa's bill would cost PGE an additional $1,743,000.

The rural electric cooperatives opposed the removal of the ad valorem tax exemption through Lee Woodin, Jewell, Ore., president, Oregon Rural Electric Co-operatives Assn, and Ivan Laird, Sitkum. The association had called a special meeting in Salem prior to the hearing at which time Woodin had declared: "The fundamental basis of rural electrification is threatened by the approach these bills make." He noted the co-ops pay real property taxes but that their power

lines are classed in Oregon as personal property and the 2% revenue tax was in lieu of levies on the systems. If the co-ops are denied this "public interest" basis, they cannot survive, Woodin argued. The bill would automatically have thrown the co-ops under the existing state laws which apply to Oregon's profit making corporations. Some 30,000 co-op members would have been affected.

Among the legislation "put in back of the book" was a bill of Rep Charles A. Tom, Rufus, to repeal the corporation excise tax exemption enjoyed by rental and public utility companies. Tom made the motion affecting this bill after it was explained the committee was having other bills prepared which would accomplish what the committee wants to do in the field of utility taxation.

FINANCIAL BRIEFS

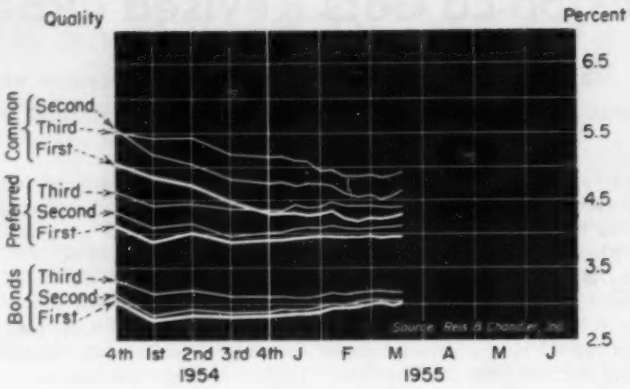
Pennsylvania Power & Light Co is planning to sell about $45 million of additional securities to take care of its construction program, estimated at $117 million, through 1958 . . . **Potomac Electric Power Co** stockholders will vote April 15 on proposal whether or not to increase the authorized common stock from 5.5 million of $10 par value to 10 million shares . . . **Appalachian Electric Power Co** has received West Virginia Public Service Commission approval to purchase the electric distribution system of Ames Heights Addition near Fayette County, W. Va., from the Ames Mining Co for $3,342.

Cincinnati Gas & Electric Co will pay May 16 a quarterly common stock dividend of 30¢ a share as compared with 25¢ a share paid in previous quarters.

Long Island Lighting Co is planning to sell 50,000 shares of 4.35% preferred at $100 a share to institutions. Subject to Public Service Commission approval, the stock will be sold late in April.

Washington State House has received bills which would boost the business and occupation tax from 10% to 60%; increase the utilities tax from 10% to 25%, and hike the retail sales tax from 3% to 3½%. This will amount to a $52.2 million tax package.

Today's Utility Yields (%)



	BONDS			PREFERRED STOCKS			COMMON STOCKS		
QUALITY	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Mar. 17	3.01	3.04	3.18	3.97	4.13	4.40	4.31	4.66	4.93
Mar. 10	3.01	3.05	3.18	3.96	4.11	4.40	4.27	4.58	4.88

Utility Earnings

COMPANY	PERIOD MONTHS ENDED		NET INCOME 1955	NET INCOME 1954	EARNINGS PER COMMON SHARE 1955	EARNINGS PER COMMON SHARE 1954
Carolina Power & Light	12	Feb.	$8,124,523	$7,381,667	$	$
Central Illinois Light	12	Feb.	3,575,737	3,361,454	3.07(a)	3.06(a)
Central Vermont Public Service	12	Feb.	1,421,658	959,834	1.33(a)	0.88(a)
Ohio Edison, consolidated	12	Feb.	20,766,327	19,585,277	3.10(a)	3.14(a)

Note—(a) Based on average shares.

Utility Financing

COMPANY AND DESCRIPTION	AMOUNT OF OFFERING (000)	OFFERING PRICE	YIELD TO PUBLIC
MARCH 16-23			
COMMON STOCK			
Oklahoma Gas & Electric—331,643 sh (being offered commonholders on a 1-for-8 basis, record Mar. 16 to expire April 5)	$10,447	$31.50	5.08%
Arkansas Missouri Power—36,868 sh (being offered commonholders on 1-for-12½, record Mar. 14 basis without underwriting)	747	20.25	5.53
SCHEDULE FOR MARCH-APRIL			BID DATE
BONDS			
Arkansas Power & Light—1st mtg due 1985	$18,000	.....	Mar. 30
Kentucky Utilities—1st mtg due 1985	5,000	.....	April 5
West Texas Utilities—1st mtg due 1985	7,500	.....	April 6
Central Maine Power—1st mtg due 1985	12,000	.....	April 12
Philadelphia Electric—1st mtg due 1985	50,000	.....	April 25
PREFERRED STOCK			
Florida Power & Light—305,000 sh	.....	.....	Mar. 29(a)
Public Service Co. of Indiana—202,431 sh $100 par conv. cum (to be offered stockholders on 1-for-21 basis)	.....	.....	.....
California-Pacific Utilities—50,000 sh 5% cum $20 par	.....	.....	.....(b)
COMMON STOCK			
Savannah Electric & Power—165,000 sh of which 100,000 sh will be sold by Donner Estate and balance by company	.....	.....	April 14(c)

Note—(a) Merrill Lynch—Kidder Peabody & Co group, underwriters; (b) First California Co group underwriters; and (c) First Boston—Stone & Webster group, underwriters.

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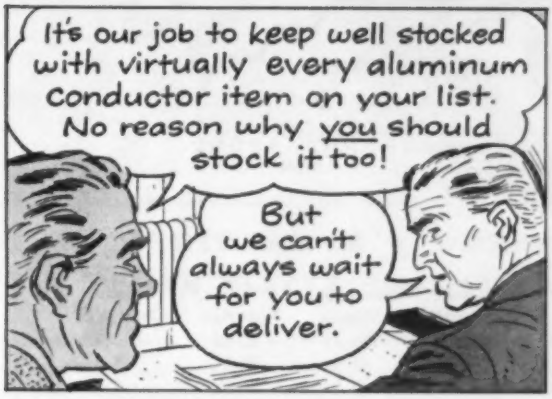
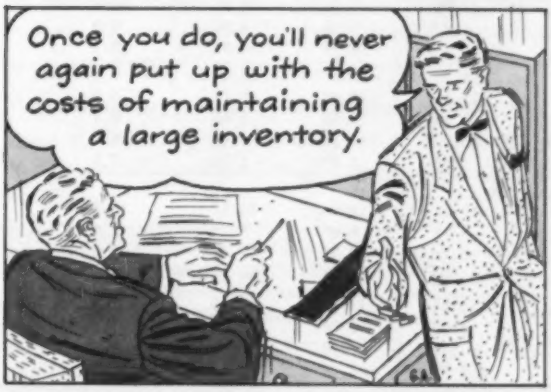
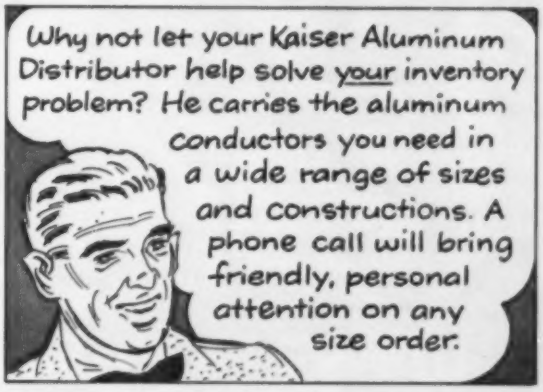
We can help perhaps more than you think. Here's how...


It's our job to keep well stocked with virtually every aluminum conductor item on your list. No reason why you should stock it too!
But we can't always wait for you to deliver.

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Central Electric Supply Co., Inc.
Champion, Inc.
City Electric Distributors, Inc.
Corpus Christi Hardware Co., Inc.
Crescent Electric Supply Co.
Dauphin Electrical Supplies
Dutton-Lainson Co.
Electrical & Mechanical Supply Corp.
Eoff Electric Co.
Evans Electrical Supply, Inc.
Florida Electric Supply, Inc.
George H. Wahn Co.
Hampden Electric Supply Co.
Hunzicker Brothers
Interstate Electric Co. of Shreveport, Inc.
Mack Electric Supply Co.
Maydwell & Hartzell, Inc.
Monroe Hardware Co.
Nelson Electric Supply Co.
Ozark Electric Supply Co.
Russell Belden Electric Co.
S. M. Supply Co., Inc.
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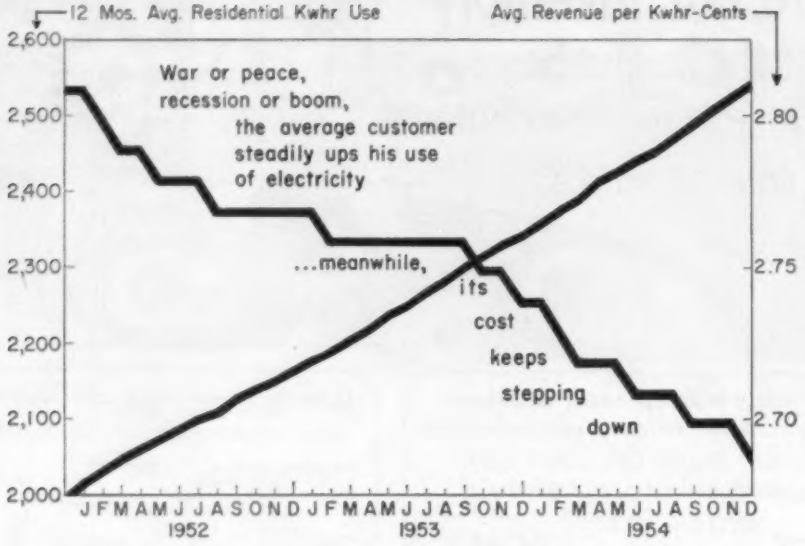
Kaiser Aluminum

The Nation's Largest Supplier of Aluminum Triplex and Weatherproof Conductor

STATISTICS



Power Statistics . . .

		Latest Month	Preceding Month	Year Ago	Annual Change %
Capacity	Jan.	103.62	102.52	91.68	13.0
Peak—Class I Systems, million kw	Dec.	85.5	82.0	78.6	8.8
Estimated Dec. '55 Peak	Dec.	95.9	96.1	97.6	−1.7
Production–billion kwhr	Jan.	43.96	43.43	39.42	11.5
hydro		9.43	9.05	8.90	6.0
fuel		34.53	34.38	30.52	13.1
Sales—billion kwhr	Dec.	35.25	33.87	32.31	9.3
residential		11.15	10.07	9.77	14.0
commercial		6.22	6.14	5.60	8.5
industrial		15.57	15.38	14.83	6.8
other		2.30	2.29	2.12	7.5
Fuel Consumption	Jan.				
coal—million tons		12.02	11.90	10.92	10.1
oil—million barrels		8.91	7.67	8.29	7.6
gas—billion cu ft		65.13	74.93	67.41	−3.4
Net Income Class A & B Co's—$ million	Dec.	109.05	94.91	100.86	8.1
Residential Customers—millions	Dec.	43.14	43.04	41.98	2.8
revenue per kwhr		2.69¢	2.70¢	2.74¢	−1.8
avg. kwhr per customer		2,549	2,528	2,346	8.7
avg. annual bill		$68.57	$68.26	$64.28	6.7

Business Statistics . . .

Indexes: 1947–49 = 100					
FRB Industrial Production	Feb.	135	131	126	7.1
ENR Construction Cost	Mar.	135.4	135.1	128.7	5.2
BLS Cost of Living	Jan.	114.3	114.3	115.2	−0.8
NEMA Sales	Jan.				
insulation materials		132	138	124	6.5
electric appliances		118	84	90	31.1
household refrigerators		96	62	95	1.1
Wholesale prices	Jan.				
motors and generators		121.6	121.8	124.3	−2.2
transformers and regulators		128.1	128.1	128.1	....
switchgear and fuses		135.3	135.3	135.1	0.1
GNP—annual rate—$ billion	4th Qtr.	362.0	355.5	360.5	0.4

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